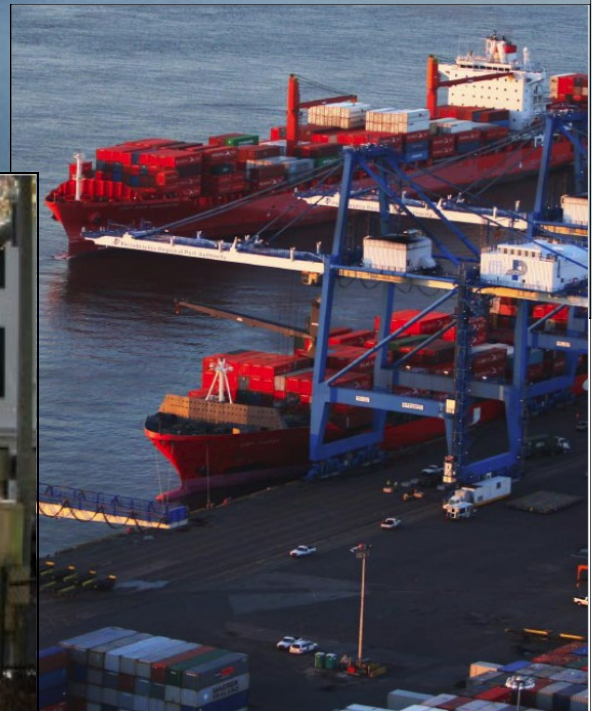




# Developing Regional Long Range Plans

## Resource Guidance for Pennsylvania Planning Partners



Center for Program Development and Management

PO Box 3365

Harrisburg, PA 17105-3365

PHONE: 717.787.2862

FAX: 717.787.5274

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# INTRODUCTION



# Purpose of this Document

The purpose of this document is to assist the Pennsylvania Department of Transportation (PennDOT) and the Metropolitan and Rural Planning Organizations (MPO/RPO) in developing more effective long range transportation plans.

Without clear requirements and structure, many planning partners have been forced to advance their individual Long Range Transportation Plan (LRTP) process, with little or no guidance as to what constitutes a good plan or product. This has resulted in plans varying widely in quality, substance, and content. It is important to recognize Pennsylvania's unique and progressive treatment of the rural portions of the state in that RPOs, though not federally recognized, are considered to be equal PennDOT partners with the MPOs.

This document presents guidelines for MPOs and RPOs for the development of their LRTP. It incorporates a checklist of federal and state requirements as well as provides best practices and resources in each of the chapters to help MPOs and RPOs in the development and update of their long range planning documents. Our expectation is that over time, this guidance will enable planning organizations to develop their plans more effectively and will further improve the quality of long range transportation planning in Pennsylvania.

In developing this document, we have focused the discussion and recommendations on issues and challenges identified by Pennsylvania planning organizations, county and municipal planners, local government associations and federal highway officials. In the interest of keeping the document most useful, we have limited its length, while including suggested sources of additional information on each topic. It is expected that this guide will continue to be updated as planning requirements and best practices evolve with the assistance of our MPO/RPO planning partners.



# Creating a Direction

While long range planning is required under both the statewide and metropolitan planning regulations, it is more importantly a key power and tool that the state and MPO/RPO have to effectively utilize to shape transportation and economic investments that help establish regional development form.

First, the planning process provides an opportunity for citizens, government officials, planners, and associated stakeholders to come together to visualize a region's future, identify trends taking place within the region, and set goals for what the region hopes to achieve within the next 20 or more years. Furthermore, the planning process allows for update cycles to consistently revisit the vision and goals and re-assess the region's changing needs and support the region's desired transportation direction.

A LRTP presents values and priorities that coordinate direction across various planning disciplines and geographies. Planners can include these values and priorities in other plans that address the environment, housing, and economic development in order to make improvements more strategic and effective across their region. Planning partners can also work in tandem with neighboring regions, the state, and localities to better coordinate planning approaches for more productive results. Transportation needs and issues are not contained within political boundaries, so long-term planning provides the opportunity for regions to openly communicate their vision to local planning partners, officials and communities are working in a common direction.

LRTPs also routinely address smart growth principles, the land use and transportation connection, the evaluation of alternative growth strategies, and the region's vision for future growth.

The integration and the linkage between planning and the National Environmental Policy Act (NEPA) principles is also an important element of a plan's direction. The LRTP can reinforce and strengthen the process for planning for proposed transportation priorities. In the early stages of transportation planning the LRTP can evaluate purpose and need, transportation infrastructure balance, developing alternatives, environmental protection or community/neighborhood preservation, NEPA fatal flaws, and other factors.

Overall, the LRTP—both the document and the process—is an opportunity for a region to invest in its identity and future. Given the scale and longevity of investment and the impact it has on a region's economy and quality of life, the transportation system demands thoughtful planning. A LRTP is critical in helping a region realize its vision for the future.





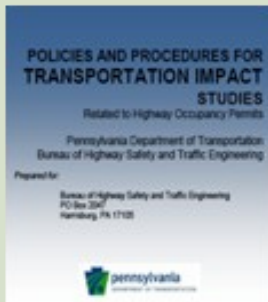
# Overview of the Transportation and Comprehensive Planning Structure

## RESOURCES:

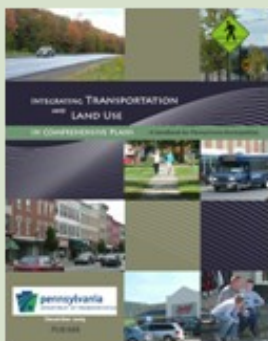
[PennDOT Linking Land Use and Transportation Planning](#)

[Subdivision and Land Development Ordinances](#)

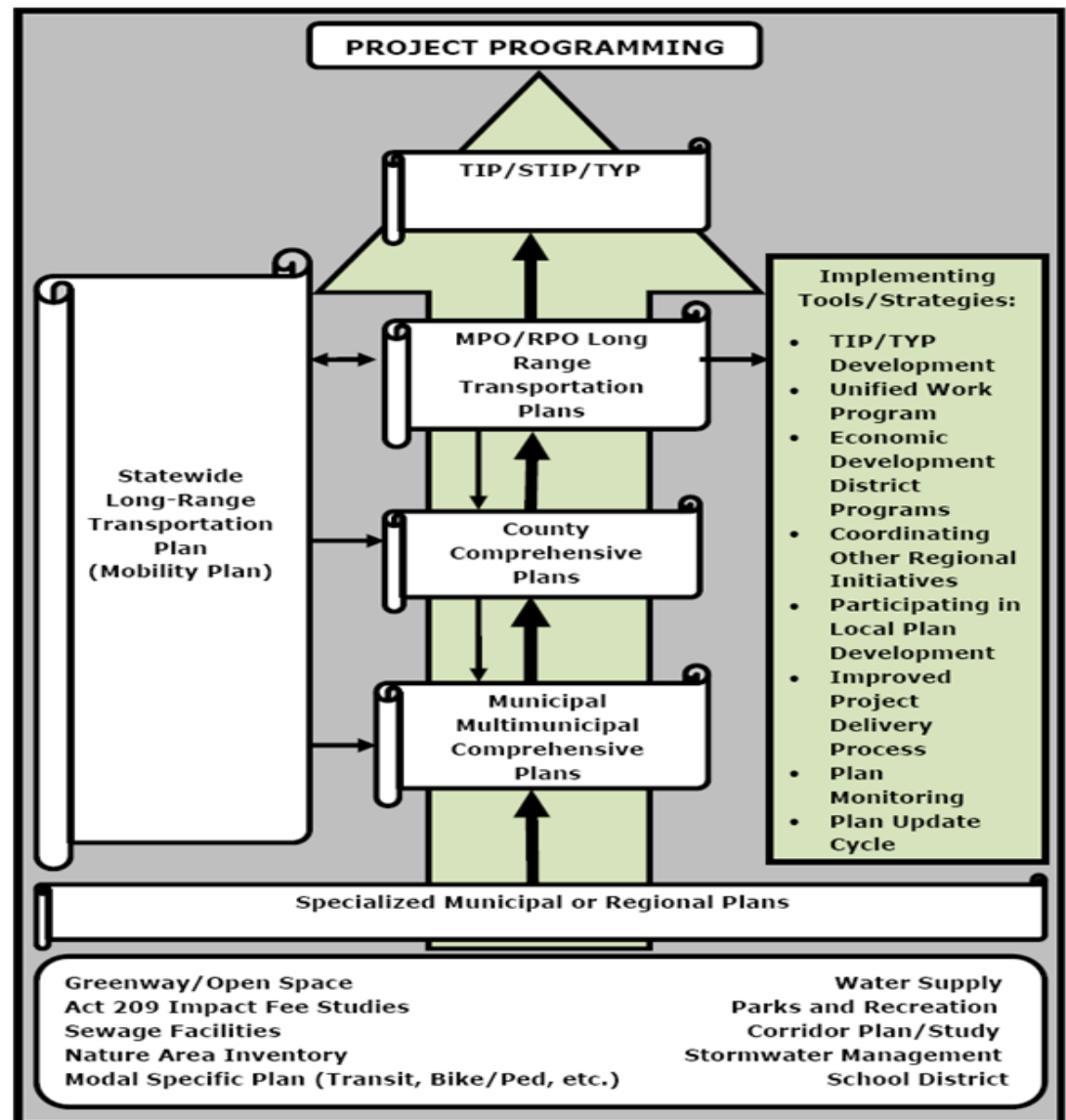
[Policies and Procedures for Transportation Impact Studies Related to Highway Occupancy Permits](#)



[Integrating Transportation and Land Use in Comprehensive Plans](#)



One of the goals of this document is to establish a stronger relationship between the regional LRTP, the statewide LRTP (PA Mobility Plan), the Transportation Improvement Program (TIP)/Statewide Transportation Improvement Program (STIP)/Twelve Year Program (TYP), and county comprehensive plans. Transportation planners are aware of the important role land use patterns play in supporting transportation plans and systems. The LRTP provides the opportunity for transportation, land use, and economic development planning to be integrated which can lead to less disparity between transportation goals and land use and development patterns. The coordination of the regional LRTP and the county comprehensive plan(s) is important to support appropriate growth and development throughout the region, as well as, to effectively plan future transportation and land use patterns.





# Key Changes to the 2010 LRTP Guidance

This document is an update to the 2006 Developing Regional Long Range Plans: A Guidance for Pennsylvania Planning Partners. The following section outlines the key changes found in the 2010 update.

Recognizing that each of Pennsylvania's planning partners has unique regional issues, it is neither PennDOT's desire nor intent to impose specific requirements regarding the process of developing a regional LRTP. PennDOT recognizes that each planning partner must customize its approach according to local conditions and circumstances—factoring in considerations such as the geographic size of the region, current and expected future conditions, specific regional opportunities and challenges, and budgetary and staffing constraints. Planning organizations may choose to use the general framework provided with minimal changes or work with the PennDOT Office of Planning to develop a specialized process that better reflects their needs and circumstances.

In addition, several general long range transportation planning resources are available via resource links located throughout the document. These sites are updated on an ongoing basis, and should be periodically checked for new and updated guidance and resources when updating a region's LRTP.

For each major activity presented, there is a general discussion of the activity, a list of issues that should be considered, and resources and examples. These items are not intended to provide an exhaustive or mandatory approach, but are presented to expedite thinking about each activity.

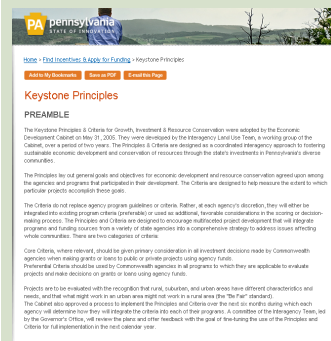




# Key Changes to the 2010 LRTP Guidance

## RESOURCES:

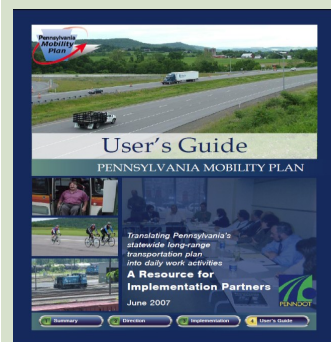
### Keystone Principles



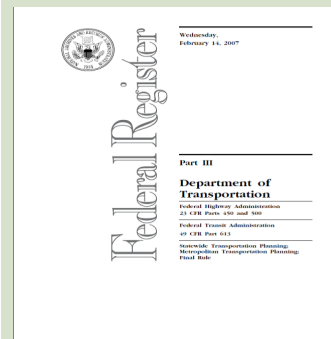
### Smart Transportation



### PA Mobility Plan— User's Guide



### Federal Rulemaking



### Incorporation of the Keystone Principles and Criteria:

Pennsylvania's Keystone Principles and Criteria layout general goals and objectives for economic development and resource conservation agreed upon among state agencies and programs that participated in their development. Aligning plans with the Keystone Principles and Criteria will enable regions to better compete for an increasingly limited range of funding sources.

### Incorporation of Livability Principles and Themes:

In preparing a LRTP the MPO/RPO is encouraged to consider the incorporation of livability principles and themes. Smart Growth proposes to manage capacity by better integrating land use and transportation planning. The desire to go "through" a place must be balanced with the desire to go "to" a place. Roadways have many purposes: providing local and regional mobility, offering access to homes and businesses, and supporting economic growth. Focusing plans on a more sustainable paradigm provides a framework to balance the value and cost of projects, allows for greater flexibility in project identification and design, and presents an opportunity to build better communities for future generations of Pennsylvanians.

### Consideration of statewide LRTP goals and objectives as outlined in the PA Mobility Plan Document:

The Mobility Plan was developed to be responsive to federal and state policy, supportive of economic development and quality of life, strategic in how we invest our time and money, unified in the priorities we pursue, systems oriented in supporting all modes, collaborative in establishing and working toward a desired future direction, and focused on implementation and results. Coordinating statewide and regional goals and objectives lays the foundation for a stronger linkage between planned and programmed projects.

### Improved Financial Guidance for Long Range Planning:

Financial planning takes a long range look at how transportation investments are funded, and the possible sources of funds. PennDOT, MPOs/RPOs and Public Transportation Operators must consider funding needs over both the 20+ year period of the LRTP and the 4 year period of the TIP/STIP. LRTPs must contain a financial plan that identifies current/potential funding sources for needed investments while still demonstrating a reasonably reliable means to maintain and operate the existing system.





## Key Changes to the 2010 LRTP Guidance

### **Asset Management Tools:**

Transportation asset management is a strategic framework for making cost-effective decisions about allocating resources and managing infrastructure. It is based on a process of monitoring the physical condition of assets, predicting deterioration over time and providing information on how to invest in order to maintain or enhance the performance of assets over their useful life. The goals of a transportation asset management program are to minimize the life-cycle costs for managing and maintaining transportation assets including pavements, bridges, tunnels (if applicable), Intelligent Transportation Systems (ITS), traffic signals, and modernization of public facilities and equipment.

### **Cost Estimation Process:**

LRTPs must present a methodology for developing cost estimates throughout the project development process, by taking into account a project's complexity. To successfully address transportation needs, MPOs/RPOs must have reliable cost estimate factors and associated documentation that support the development from early conceptual alternatives through to definitive project Plans, Specifications & Estimates (PS&E).

As a result of SAFETEA-LU, costs of future transportation projects must use "year of expenditure (YOE) dollars" rather than "constant dollars" in cost and revenue estimates to better reflect the time-based value of money. MPOs/RPOs must make certain project costs identified in both the LRTP and the TIP are in YOE dollars. The cost estimate should clearly specify how inflation was considered for the project and the LRTP clearly shows that the estimate is expressed in YOE dollars.

### **Project Selection Criteria:**

Maintaining existing assets should be the first priority in the selection of projects. Applying the Keystone Principles and Smart Transportation to maintenance, as well as, new investment, can focus maintenance dollars on the most important assets. This may facilitate growth in the most desirable areas, and through increased economic activity and fuel tax receipts (and other funding mechanisms), result in more cost effective use of limited state and federal transportation funds. Utilizing the Keystone Principles and Smart Transportation concepts would help guide development, influence land use decisions, and mitigate the related impacts on the transportation system. When selecting projects that will utilize safety funds, fatal and serious injury crash locations which indicate the highest safety needs on the transportation system should be reviewed.



## Key Changes to the 2010 LRTP Guidance

### **Guidelines to incorporate Linking Planning and NEPA in the Long Range Transportation Plan (LRTP):**

MPOs, RPOs, state and local agencies can achieve significant benefits by incorporating environmental and community values into transportation decisions early in the planning stage. Linking Planning and NEPA is an integral part of long range-transportation planning. Agencies' inclusions of these considerations in transportation planning can carry activities or decisions into the NEPA process. For example, transportation and environmental staff can identify a project's purpose and need and begin alternatives analysis in planning and use that information when conducting environmental reviews. These activities can lead to streamlined processes by reducing duplication of work and better decisions by promoting early coordination of planning and environmental staff.

### **Performance Measures:**

Performance measures demonstrate how well a region's transportation system is doing its job in meeting the goals and expectations of the region's LRTP. Measuring performance of the LRTP is a way to gauge the impacts of the decision making process. Performance measures answer questions as to whether the transportation system is getting better or worse over time and whether transportation investments are correlated or linked to stated goals and outcomes.

**I-80's North Fork Creek Bridge, Jefferson County**





# **PLANNING REGULATIONS AND POLICIES FOR A LONG RANGE TRANSPORTATION PLAN**



# Characteristics of Successful Long Range Plans

Based on a review of best practices in the development of long range transportation plans (LRTPs) both within Pennsylvania and nationally, there are many common attributes of the more successful plans. While not every plan will display all of these qualities, Metropolitan Planning Organizations (MPOs) and Rural Planning Organizations (RPOs) should strive to achieve these qualities in their plans.

**Create Local/Regional Ownership:** Developing the plan with an active focus on and engagement of its stakeholders increases the likelihood that they are fully vested in the plan and that it will be fully implemented.

**Emphasize Planning, not Programming:** Although the plan must include a fiscally-constrained list of projects/solutions, the emphasis should be on defining the planning vision for the future and determining what priorities or types of projects best achieve that vision, rather than simply generating a project list.

**Collaborate with Other Stakeholders:** Plan development should include meaningful and ongoing consultation with PennDOT, counties, municipalities, neighboring planning regions, and other partners. This will take into account the issues and concerns of other stakeholders and that it is coordinated with their planning efforts.

**Support Other Relevant Plans:** A long range transportation plan exists within the larger context of community planning, infrastructure development, and political realities, and should therefore take into consideration other relevant local, regional, and statewide plans that are likely to impact the transportation system.

**Articulate Clear Goals and Objectives:** The goals and objectives articulated within the plan should be straightforward and easily understood, relate to the overall vision of the region, and provide a basis for making investment decisions.

**Address Quality of Life Issues:** Although they are not easily quantified, issues such as safety, health, recreation, and access to employment and services have taken on increasing importance in transportation and community planning. The plan should explicitly describe how these issues are addressed in the decision-making process.

**Maintain an Open and Transparent Process:** Because the process used to develop a long range plan is not always clear from the final products, the plan should include a description of how the plan was developed, including public and resource agency outreach, technical analyses, and other critical work program elements. From the outset, and in consultation with key stakeholders, develop a process that works for the region and those involved in the plan's development.

**Capitalize on the Experience of Others:** While it is important that every plan be tailored to the issues and context of the particular region, there is also much to be learned from what has been done successfully by others, whether in terms of public participation, technical analysis, document presentation, or other areas of plan development.



# Characteristics of Successful Long Range Plans

**Consider Multiple Futures (Scenario Planning):** To convey the impacts that different courses of action could have, planning organizations should use the plan as an opportunity to explore possible “differing futures,” in terms of issues such as financing, modal emphasis, and land use.

**Develop an Evaluation Framework:** In developing evaluation criteria that flow from the overall goals and objectives, planning organizations need to determine how they can measure the performance of proposed solutions in a structured manner.

**Employ Strong Technical Analyses:** To provide a basis for properly evaluating potential solutions, the plan should be based on—but not necessarily solely driven by—a strong technical analysis that is clearly described in the plan document.

**Link Solution Prioritization to Goals, Objectives, and Policies:** Rather than simply maintaining the existing project pipeline, prioritization of solutions should be clearly tied to the plan’s goals, objectives, and policies through the use of linked evaluation criteria.

**Support a Multi-modal and Intermodal Future:** LRTPs should integrate all modes and identify how those modes interact. This is an opportunity to more efficiently move people and goods and strengthen the economy. Congestion on both our freight and passenger networks costs billions of dollars a year in direct costs and lost productivity for businesses and citizens alike. Identifying multi-modal and intermodal strategies to alleviate congestion and reduce travel times may also lead to better uses of very limited transportation dollars.

**Integrate Land Use and Transportation:** Considering the transportation consequences of land use decisions and identifying strategies to manage growth during the LRTP development helps to alleviate concerns about traffic congestion, reduce pollution, protect habitats and pristine environments, preserve farmland and open space, enhance community character, and helps to create a more affordable, livable, and sustainable future for a region.

**Distribute Investments Equitably (Environmental Justice):** The plan should propose transportation solutions that the burden or benefits are distributed fairly, both geographically and across racial or socioeconomic groups.

**Organize Solutions in a Relevant Format:** The plan should organize potential solutions in a format that is relevant and useful for the region. The presentation of findings could be organized by mode, by geography, by corridor, or by some hybrid of these approaches.





## Characteristics of Successful Long Range Plans

**Structure the Plan to be Relevant to Local Issues:** Planning partners should consider the types of problems and solutions that are most relevant to the region, and structure the plan to be responsive to these issues. If the region is experiencing significant corridor congestion, it may make sense to structure the plan in terms of corridors; whereas a region that is experiencing concentrated growth in specific areas may want to structure its plan according to geographic centers.

**Include an Implementation Plan:** Because the plan defines a framework for future programming/investment decisions, it should clearly define how the plan's goals, objectives, and policies will transfer to the development of programming documents, such as the Twelve-Year Plan (TYP) and Transportation Improvement Programs (TIP) and other planning/project development initiatives.

**Be Creative:** PennDOT wishes to see planning partners tailor their approach and product to local issues and conditions. While there are some basic requirements as well as some typical elements of most long range plans, PennDOT challenges its planning partners to push themselves to set a compelling direction for transportation planning in their region. Utilizing visualization techniques has become an increasingly essential part of transportation planning. Providing a clear idea of proposed policies and plans can strengthen public participation and help maintain a shared awareness about the collective implications of decisions.



## Regional Long Range Transportation Plan Checklist

The following LRTP Checklist is offered as a reference of key sources of federal regulations and state policy recommendations for consideration in developing the LRTP. The checklist is consistent with current federal regulations up to and including SAFETEA-LU. State policy recommendations such as integrating the Keystone Principles and Smart Transportation have also been incorporated into the checklist. In addition, the State is requesting the MPOs and RPOs document a methodical approach to address their region's maintenance needs. The document checklist includes general; coordination/consultation; regional modal strategies; programming/operations/asset management/safety; and financial requirements.

General	Source	Considered
The LRTP addresses the minimum 20 year planning horizon.	Federal	
The LRTP was presented at an Agency Coordination Meeting (ACM).	Federal	
The LRTP discusses the types of environmental mitigation and opportunities and potential areas to carry out the activities.	Federal	
The LRTP was presented at a public meeting(s) and solicited input.	Federal	
The LRTP considers and references county and multi-jurisdictional comprehensive plans.	Federal / State	
The LRTP is consistent with the Statewide LRTP (Mobility Plan) objectives.	Federal / State	
The LRTP provides consideration for projects, strategies and services to address the Eight Federal Planning Factors.	Federal	
The LRTP contains an assessment of capital investment and other strategies to preserve the existing and future transportation infrastructure.	Federal	



## Regional Long Range Transportation Plan Checklist

Consultation / Cooperation	Source	Considered
The LRTP considers and references the MPO/RPO Public Participation Plan (PPP).	Federal	
Was the required comment period provided to those specified in the region's PPP?	Federal	
Consultation occurred with relevant federal, state and local representatives including those responsible for responsible for natural resources, environmental protection, conservation, and historic preservation.	Federal	
Does the LRTP include an environmental overview?	Federal	
The LRTP addresses Smart Transportation Principles and Themes.	State	
The LRTP considers the Keystone Principles and Criteria.	State	
Consultation occurred with relevant private sector organizations.	Federal	
Consultation occurred with appropriate Native American Tribal Governments.	Federal	
Consultation occurred with relevant regional air quality planning authorities (if applicable).	Federal	
Does the LRTP include your Coordinated Public Transit Human Services Transportation Plan?	Federal	
Regional Modal Strategies	Source	Considered
The LRTP identifies and addresses the region's intermodal and connectivity issues.	Federal	
Identifies and addresses the region's bridges and highways.	Federal	
Identifies and addresses the region's mass transportation, including passenger rail (if applicable).	Federal	
Identifies and addresses the region's airport system (if applicable).	Federal	
Identifies and addresses the region's bicycle and pedestrian needs.	Federal	
Identifies and addresses the region's rail freight.	Federal	
Identifies and addresses the region's ports (if applicable).	Federal	
Identifies and addresses the region's goods movement.	Federal	
Identifies and addresses a Transportation Security Evacuation Plan.	Federal	



## Regional Long Range Transportation Plan Checklist

<b>Programming/Operations/ Asset Management / Safety</b>	<b>Source</b>	<b>Considered</b>
If applicable, does the LRTP consider and reference your congestion management process (CMP), including the identification of single occupancy vehicle (SOV) projects in non-attainment areas?	Federal	
Is the LRTP consistent with the regional Intelligent Transportation System (ITS) architecture plan?	Federal	
Does the LRTP identify performance measures?	State	
Does the LRTP meet the statewide highway asset management goals?	State	
Does the LRTP meet the statewide bridge asset management goals?	State	
Does the LRTP identify and address transportation safety needs and is consistent with the Strategic Highway Safety Plan and available IT data?	Federal	
Does the LRTP contain system-level estimates of costs and revenue sources that are reasonably available to adequately operate and maintain federal-aid highways and public transportation?	Federal	
<b>Financial</b>	<b>Source</b>	<b>Considered</b>
Is the LRTP fiscally constrained?	Federal	
Are all regionally significant projects identified?	Federal	
Includes a constrained project list as well as an optional list of unfunded needs for illustrative purposes?	Federal	
Accurately projects available funds including discretionary funds and earmarks.	Federal and State	
Utilizes inflation rates to reflect "Year of Expenditure" (YOE) dollars.	Federal	
Identifies financial strategies.	Federal	

### RESOURCES:

United States Code Title 23 Part 450

United State Code Title 49 Subtitle III Chapter 53



# Federal Regulatory Requirements

## **Federal Planning Regulations**

Federal planning regulations date to the early 1960s when, under the Kennedy Administration, the federal government created requirements that transportation planning be conducted in a “comprehensive, continuous, and coordinated” manner. The Federal-Aid Highway Act of 1973 further formalized the 3-C’s process by mandating the creation of MPOs in each urbanized area with a population of 50,000 or greater. While long range transportation planning was conducted in some fashion over the next three decades, it wasn’t until the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) that planning requirements—and the role of the MPO and by extension RPO—were significantly strengthened.

## **ISTEA (1991)**

Federal long range planning regulations promulgated under ISTEA state that the purpose of the metropolitan planning process is to establish a “framework for making transportation investment decisions in metropolitan areas.” This language was crafted with the intent of enabling states and regions, in cooperation with transit agencies, to develop regional transportation plans that reflect unique state and local priorities. The legislation strengthened the linkage between transportation planning and programming (prioritizing and funding specific projects) and formalized the way metropolitan areas were to address transportation and transportation-related impacts. However, the regulatory requirements were still rather broadly defined and non-prescriptive.

## **TEA-21 (1998)**

The Transportation Equity Act for the 21st Century (TEA-21) was enacted in 1998. TEA-21 maintained most of the regulatory requirements of ISTEA, providing guidance on what needs to be considered in a plan without actually prescribing how to get there. Planning regulations relating to long range transportation planning are published in the Code of Federal Regulations (CFR), Part 23.

With the authorization of TEA-21, the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) were charged with revisiting the existing planning regulations. Discussions regarding proposed modifications to planning regulations persisted during the early years of the reauthorization, but the general consensus was there was not a need to substantially change the planning requirements of ISTEA.

## **SAFETEA-LU (2005)**

On August 10, 2005, after nearly two years of extensions, the successor to TEA-21 was signed into law. The legislation is known as the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). While states and MPOs were not required to abandon their current plan and program cycles to immediately incorporate changes from SAFETEA-LU, plans adopted after July 1, 2007 must be in compliance with the new requirements.





## SAFETEA-LU Items Impacting the Development of LRTPs

**Public Participation Plan/Outreach:** Each planning organization shall provide citizens, affected public agencies, representatives of public transportation employees, freight shippers, private transportation providers, representatives of public transportation users, representatives of pedestrian walkways and bicycle transportation facilities users, representatives of the disabled, and other interested parties with a “reasonable opportunity” to comment on the LRTP. The PPP must be developed prior to updating the LRTP and Statewide Transportation Improvement Program (STIP) and shall provide for input from the stakeholders and other interested parties during its preparation.

**Contents of the Participation Plan Shall Include:** Development of the LRTP in consultation with all interested parties; provision that all interested parties have reasonable opportunities to comment on the contents of the LRTP; all public meetings are held at convenient and accessible locations; employment of visualization techniques to describe the LRTP (such as a geographic information system (GIS), maps, graphs, charts and other visual methods of interpreting data and information); and, making the information available to the public in electronic accessible format and means, such as a web site in order to afford a reasonable opportunity for all parties including the general public to comment on the LRTP. A minimum public comment period of 45 days shall be provided before the initial or revised PPP is adopted by the planning organization.

**Changes to Federal Planning Factors:** The planning factor to “protect and enhance environment, promote energy conservation and improve quality of life” was expanded to also include “promote consistency between transportation improvements and State and local planned growth and economic development patterns.” Equally important, safety and security were separated into individual planning factors to highlight the importance of each issue.

**Public Transit/Human Services Transportation Plan:** A public transit/human services transportation plan should be consistent with the transportation planning process.

**Long Range Transportation Plan Cycle Updates:** A LRTP shall be updated every four years, or more frequently, if the planning organization elects to do so. In attainment regions, the planning organization may elect to update their LRTPs every five years.

**Identify Transportation Facilities:** A LRTP shall include an identification of transportation facilities, including major roadways, multimodal and intermodal facilities, and intermodal connectors.

**Identify Mitigation Activities:** A LRTP shall include a discussion of types of potential environmental mitigation activities and potential areas to carry out these activities that may have the greatest potential to restore and maintain the environmental functions affected by the plan.



## SAFETEA-LU Items Impacting the Development of LRTPs

**Consultation and Coordination:** The LRTPs environmental mitigation/opportunities discussions shall be developed in consultation with Federal, State and Tribal land management, wildlife, and regulatory agencies. Additional consultation, as appropriate, with State and local agencies responsible for land use, natural resources, environmental protection, conservation and historic preservation during development of the LRTP is required.

**Financial Plan:** A Financial Plan shall demonstrate how an adopted LRTP can be implemented, indicate resources that can reasonably be expected to be available to carry out the plan, and recommends any additional financing strategies for needed projects and programs. Total dollar amount for projects included in the STIP must take into account a projected rate of inflation. The MPO, transit operators and State shall cooperatively develop estimates of funds that will be available to support plan implementation.

**Identify Operational and Management Strategies:** Operational & Management Strategies shall be included in order to improve the performance of the existing transportation facilities, to relieve vehicular congestion and maximize the safety and mobility of people and goods.

**Identify Capital Investment Strategies:** Capital investment strategies and other strategies shall be included to preserve the existing and projected future transportation infrastructure, and provide for multimodal capacity increases based on regional priorities and needs.

**Congestion Management Process:** The CMP should be an integral part of developing LRTPs and STIPs for MPOs that also serve as transportation management areas (TMAs).

**Visualization Techniques and LRTP Publication:** A LRTP shall include visualization techniques such as GIS based, graphs, maps, bar charts, pie charts and other visual aids that a public participant understands without great technical detail, but more comprehensive and basic. The LRTP shall be available on a website and for the life of the plan.

**Safety Issues:** SAFETEA-LU separated “safety” and “security” as planning factors. LRTPs should include a safety element that incorporates and summarizes the goals such as reduction of fatalities, priorities and projects that will reduce serious injury crashes and fatalities, and align with the Pennsylvania Strategic Highway Safety Plan.

**Security Issues:** LRTPs should include a security element that incorporates and summarizes the goals, priorities and projects that are contained in emergency relief and disaster preparedness plans that support homeland security and the personal security of the public.

**RESOURCES:** [SAFETEA-LU](#)



## SAFETEA-LU Items Impacting the Development of LRTPs

It is important to recognize that SAFETEA-LU expired on September 30, 2009. Among the initial proposals identified for the new transportation authorization legislation include livability and greenhouse gas emission reduction.

**Livability:** The livability initiative would establish a focal point to advance environmentally sustainable modes of transportation, including transit, walking, and bicycling. This initiative encourages integrated planning, linking land use and transportation planning, to support the creation of livable communities. It also recognizes that roadways should be built with the needs of all users in mind and that States and metropolitan regions should consider comprehensive street design principles. Comprehensive street design takes into account the needs of all users, including motorists, motorcyclists, transit riders, cyclists, pedestrians, the elderly, and individuals with disabilities. Comprehensive street design principles are not prescriptive, do not mandate any particular design elements, and result in greatly varied facilities depending on the specific needs of the community in which they are located.

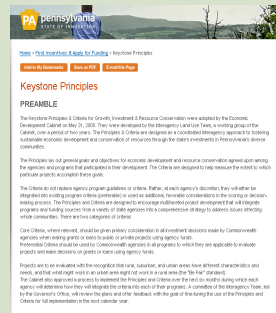
**Greenhouse Gas Emission Reduction:** The greenhouse gas emission reduction initiative would change the transportation planning process by linking transportation planning with greenhouse gas emissions reductions. The Environmental Protection Agency, in consultation with USDOT, is expected to establish national transportation related greenhouse gas emissions reduction goals. USDOT, under the existing transportation planning process, is expected to require States and metropolitan regions to develop surface transportation-related greenhouse gas emission reduction targets and incorporate strategies to meet these targets into their transportation plans. USDOT, through performance measures, would verify that States and metropolitan areas achieve progress towards national transportation-related greenhouse gas emissions reduction goals.



# State Policies

## RESOURCES:

[Commonwealth of Pennsylvania Keystone Principles for Growth, Investment, and Resource Conservation – May 2005](#)



**Keystone Principles for Growth, Investment, and Resource Conservation:** The Keystone Principles and Criteria for Growth, Investment, and Resource Conservation were adopted by the state's Economic Development Cabinet in May 2005. The Principles and Criteria are designed as a coordinated interagency approach to fostering sustainable economic development and conservation of resources through the state's investments in Pennsylvania's diverse communities. The Principles lay out general goals and objectives for economic development and resource conservation.

The Long Range Transportation Plan (LRTP) should consider the Keystone Principles as they develop the vision, goals, and objectives by doing so the region can guide investment and support local growth and economic development.

### Keystone Principles

- Redevelop first
- Provide efficient infrastructure
- Concentrate development (i.e., redevelopment, infill, etc.)
- Increase job opportunities
- Foster sustainable businesses
- Restore and enhance the environment
- Enhance recreational and heritage resources
- Expand housing opportunities
- Plan regionally, implement locally
- Be fair

[Transportation, Land Use, and Economic Development Initiative](#)



**Land Use, Transportation, and Economic Development (LUTED) Initiative:** In order to help make the most strategic investments and efforts for land use, transportation, economic development and conservation, state and regional agencies have been working together on the LUTED initiative. The goal is to coordinate these activities and yield high impact and benefits for communities and regions.

Regional action plans were developed to pursue projects of greater impact to a larger number of people and places, to advance projects that are regionally strategic, to articulate the desire to leverage various agency funds to support the most meaningful projects, to collaborate and leverage resources on a more regional basis, and to make decisions and investments for land use, transportation, resource conservation, and economic development in a more coordinated process at a regional level.



# State Policies

## RESOURCES:

### Smart Transportation Website



**Livability:** Livability is defined as, “partnering to build great communities for future generations of Pennsylvanians by linking transportation investments and land use planning and decision-making.” Livability requires accepting and embracing the evolving financial, environmental, technological, and community contexts when approaching the next generation of transportation challenges. It is about consistently applying the most innovative tools and ideas to meet these new challenges. In contrast to the singular vision of building bigger, wider roadways to provide utmost vehicular mobility, Smart Growth calls for linking land use and transportation planning, a focus on system maintenance and preservation, balancing priorities among all transportation modes, collaboration with planning partners, and true fiscal responsibility.

Project delays and escalating costs are discouraging to everyone involved in the transportation planning process. Early identification of plans and design solutions that are not affordable and cannot be implemented are necessary. In addition, projects should be advanced that meet the transportation agencies, community, and the general public expectations and are consistent with the LRTP. The application of the items listed below will help to promote a better understanding of the problem, key issues, potential solutions, community participation, and an early schedule and budget for the process. The intended result is that projects listed on the LRTP can be implemented with more certainty and be completed within the estimated time frame and budget.

### **Application of Statewide Livability Criteria are designed to:**

- Allocate financial resources to projects that address local, regional, and statewide priorities.
- Achieve consistent expectations between project proponents, communities, and entities that evaluate and fund projects.
- Achieve the optimum accommodation of all modes.
- Insure context sensitivity in the planning and design of projects.
- Decrease the amount of re-work in the preliminary engineering and final design phases of the project.





# State Policies

## Statewide Livability Evaluation Criteria

<b>Money Counts</b>	<b>Considered</b>
Shall identify scalable cost estimates (baseline costs) and schedules for projects on the Long Range Transportation Plan ( <u>Pub 352</u> ).	
Should identify innovative funding sources and opportunities to leverage transportation investments.	
Should identify cost/benefit effective transportation options for all modes that are scaled to the size of the problem.	
<b>Leverage and Preserve Existing Investment</b>	<b>Considered</b>
Shall identify preservation goals and maintenance needs.	
<b>Choose Projects with a High Value to Price Ratio</b>	<b>Considered</b>
Shall identify project evaluation criteria for maintenance of roads and bridges, capacity improvements, transit, goods movement, safety and enhancements.	
<b>Safety Always and Maybe Safety Only</b>	<b>Considered</b>
Shall develop and implement safety initiatives that lead to the reduction of serious crashes and fatalities.	
Shall identify high crash locations and implement improvements to measure reduction in serious injury crashes and fatalities.	
<b>Look Beyond Level of Service</b>	<b>Considered</b>
Shall document community and government involvement during project purpose and needs identification.	
Should identify opportunities to incorporate environmental justice concerns, natural resource features, and preservation of wetlands, surface and ground water resources, and air quality.	
Should identify opportunities to preserve the unique features and resources of the project area.	
Should identify opportunities to make adaptive reuse of significant architectural or historic resources.	
Should identify strategies to reduce greenhouse gas emissions/energy use and sustain environmentally sensitive land for health, habitat, and bio-diversity.	



# State Policies

## Statewide Livability Evaluation Criteria

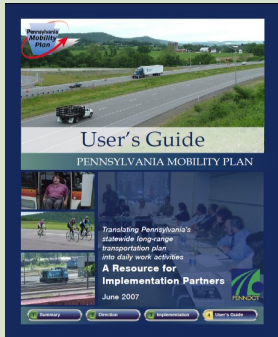
<b>Accommodate All Modes of Travel</b>	<b>Considered</b>
Shall identify strategies to maximize transit, ridesharing, walking, and biking, as well as, commuting options including the connections between the modes and support facilities/minimize single occupancy vehicles.	
Shall identify strategies for goods movement that maximize air, rail, water, and truck modal contributions including connections between the modes and support facilities.	
<b>Enhance the Network</b>	<b>Considered</b>
Should identify multi-modal transportation system solutions and/or accessibility improvements.	
Should identify strategies to improve connectivity and accessibility (including ADA requirements) though out the transportation network.	
<b>Access Management</b>	<b>Considered</b>
Shall identify regional growth areas in coordination with county/counties, municipal governments, and the public.	
Should identify opportunities to rehab/reuse/improve existing transportation infrastructure and/or public or private water or sewer capacity and services.	
<b>Understand the Context; Plan and Design within the Context/Scalable Projects</b>	<b>Considered</b>
Should identify opportunities to preserve the unique features and resources of the project area.	
Shall identify projects which are cost effective and meet the established purpose and need.	
<b>Develop Local Government as Strong Land Use Partners</b>	<b>Considered</b>
Shall document community and government involvement efforts during the development of the Long Range Transportation Plan.	



# State Policies

## RESOURCES:

[PA Mobility Plan:  
User's Guide](#)



**PA Mobility Plan:** The PA Mobility Plan is Pennsylvania's LRTP. The Plan defines a transportation direction and establishes transportation priorities, expressed through its goals and objectives. The goals and objectives were designed to coordinate activities across modes and entities, as well as, to provide tools to guide future transportation investment and ultimately improve the movement of people and goods. Historically, there have always been more proposed transportation projects than there is money to fund them. Long range plans consider the future transportation needs and resources based on alternative conditions along with the priorities of residents, businesses, and visitors. The aim is to target expenditures on the most worthwhile transportation projects that provide the greatest value.

### **Goal 1: Move people safely and securely**

- Reduce the number of fatalities, serious injuries, and crashes.
- Ensure the uninterrupted operation of vital transportation services.

### **Goal 2: Improve the quality of life by linking transportation, land use, economic development, and environmental stewardship.**

- Direct resources to support economic and community development
- Integrate land use and transportation.
- Preserve natural, historical and cultural resources.
- Promote energy conservation.

### **Goal 3: Develop and sustain quality transportation infrastructure.**

- Advance a program to achieve desired maintenance cycles
- Accelerate the use of innovative construction techniques, better materials, and improved maintenance practices.

### **Goal 4: Provide mobility for people, goods, and commerce.**

- Improve connectivity and accessibility throughout the transportation network.
- Improve transportation system operating efficiency.
- Improve transportation system reliability.

### **Goal 5: Maximize the benefit of transportation investments.**

- Improve transportation investment decision-making.
- Focus planning and investments on a core transportation system.
- Secure funding to preserve Pennsylvania's transportation infrastructure and to make strategic capacity improvements.
- Improve project delivery to expedite project development and reduce costs.



# **LINKING PLANNING AND NEPA**



# Linking Planning and NEPA

## RESOURCES:

### Linking the Transportation Planning and NEPA Processes – February 2007



### AASHTO Center for Environmental Excellence



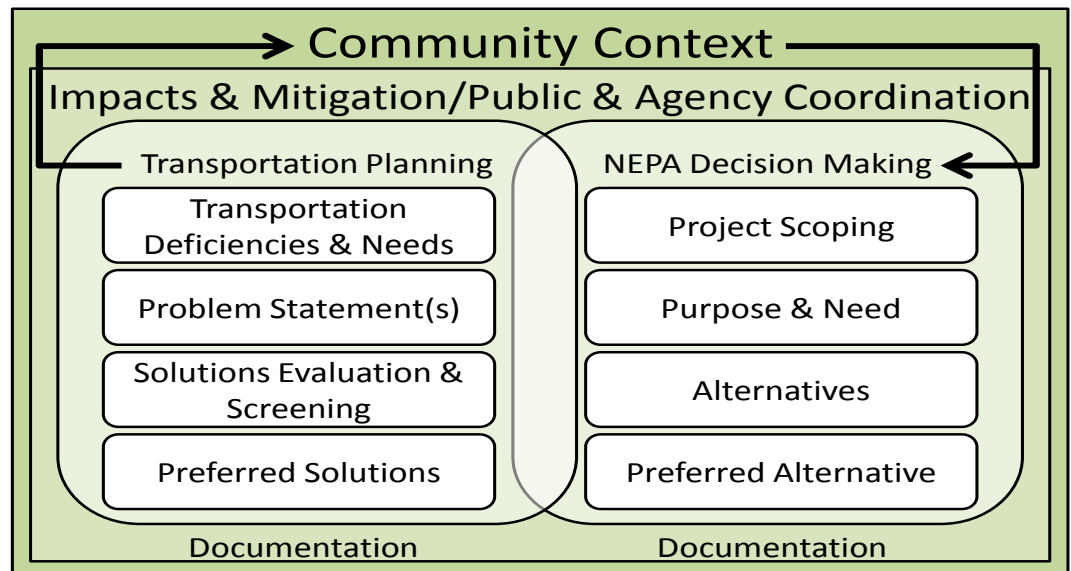
Regional and local agencies can achieve significant benefits by incorporating community and environmental values into transportation decisions early in planning and carrying these considerations through project development and delivery. Waiting until the project development stage of transportation decision-making to deal with community and environmental issues can result in significant delays in project completion. Considering community and environmental issues in identifying, defining, and prioritizing projects in the long range transportation planning (LRTP) process can lead to better results.

The goal of linking planning and National Environmental Policy Act (NEPA) initiative is to successfully integrate NEPA-type activities into the planning phases by:

- Establishing a clear link from the existing/planned land use in municipalities, counties and regions to the transportation planning and programming processes which are affected by land use decisions, and which can affect future land use decisions. All involved should understand how each part of the process affects another.
- Establishing a clear understanding of the types of information to be collected, activities to be conducted, the time of both, and documenting each to the appropriate levels, so that the documentation meets standards to be used in state (PA Act 120) and federal (NEPA) environmental study documentation.

Identification of significant resources and then avoidance, minimization, and mitigation of impacts of projects on communities and resources are often consistent with the goals and objectives set forth in long range planning.

## Linking Planning and NEPA







# Linking Planning and NEPA

## RESOURCES:

### FHWA Environmental Review Tool Kit



### Using Transportation Planning to Support the NEPA Process



### Needs Study Handbook

In the past, environmental analyses conducted in the NEPA process were often disconnected from the analysis used to prepare transportation plans, transportation improvement programs, and supporting sub area studies through statewide, metropolitan, and rural transportation planning processes in Pennsylvania. Analyses and decisions occurring during transportation planning often were not well documented and did not carry through to the NEPA process. The analyses were either not adequately documented or overlooked, and had to be repeated in the NEPA process, resulting in additional project costs and delays in implementation of transportation projects.

Documentation of how transportation deficiencies and needs support the problem statement and/or vision, goals and objectives of the LRTP Plan can often contribute to the definition of purpose and need in the NEPA process. Utilization of existing public/stakeholder involvement, data, and analysis; identification of controversy and the subsequent documentation; as well as the elimination of unreasonable alternatives are examples of where long range planning can influence and expedite the NEPA decision-making process.

Details, scope, and challenges associated with transportation problems that eventually will be included on the Transportation Improvement Program (TIP) and Statewide Transportation Improvement (STIP) should be identified in the LRTP planning process. The budget, scope, and schedule can then be identified sooner because costs, needs, and environmental impacts are identified, examined, and understood earlier.

### **Problem Assessment (Project Delivery Step 1)**

Problem Assessment is the term applied to the initial advancement of any transportation-related problem intended for consideration as part of the regional LRTP. Transportation problems can be advocated by any citizen or organization, municipal or county entity, the Metropolitan Planning Organization (MPO) or Rural Planning Organization (RPO), or state agency including PennDOT.

<b>Potential sources of problems to be identified in the LRTP:</b>
Citizens, municipal councils, school district, boards, or commissions
Municipal Comprehensive Plans
County Comprehensive Plans
PennDOT District Business Plans
Performance-based assessments or tools
Bus, rail, or air transit providers
Bicycle and/or pedestrian groups
Legislative initiatives
Private developers



# Linking Planning and NEPA

## RESOURCES:

PennDOT Design Manual 1

PennDOT Design Manual 1A

Screening Forms

MPO/RPO should determine if the problems identified are appropriate for the long range planning process. Once the determination is made the MPO/RPO should request a preliminary assessment of the problem from a broad perspective using the Level 1 Screening Form from the problem advocate.

Information on the need associated with the problem should be proactively shared by all partners including the state agencies, PennDOT, MPO/RPO, counties, and municipalities in order to provide the greatest situational awareness of the problem being evaluated. Examples of coordination efforts include but are not limited to state agencies involvement with problem advocates to identify any economic development opportunities and potential impact to environmental, historical, or cultural resources using existing inventories and mapping; PennDOT should provide data relating to asset condition, traffic counts, safety, costs, and potential funding opportunities; MPO/RPO should assist with planning and other technical expertise such as modeling; counties should provide the relevant information as it relates to its Comprehensive Plan and land use; and municipalities should provide the local context and any impending developments that may impact the problem area.

The Level 1 Screening Form enables advocates to better understand the context, potential fatal flaws, risks, and cost associated with the problem. Level 1 Screening Forms should be submitted to the MPO/RPO upon completion for public examination, further consideration in the LRTP development, and for future advancement in the project delivery process.

The Level 1 Screening Form will be used by the MPO or RPO, PennDOT or other appropriate parties to collect more data, as needed, so that a more detailed Level 2 Screening Form can be completed by those partners responsible for the creation of a list of problems to be identified for inclusion in the regional LRTP.

### Level 1 Screening Form Components:

Problem description information

Summary of need and/or opportunity identification previously documented

Land use information to include existing context, zoning, and any association or consistency with existing planning documents such as comprehensive plans or special studies

Community context information such as support for (re)development

Potential for impacts to protected environmental, cultural, or historical resources using existing resource inventories and mapping

Public or agency involvement as it exist at a time

Potential range of solutions that might be appropriate, including multi-modal considerations



# Linking Planning and NEPA

## **Problem Identification in LRTP (Project Delivery Step 2)**

The LRTP process provides an opportunity for citizens, government officials, planners, associated stakeholders, and other interested parties to come together to visualize the region's future, identify needs within the region, set goals, establish projected revenue amounts, and prioritize transportation proposals for what the region hopes to achieve within the next twenty or more years.

Furthermore, the planning process allows for update cycles to make certain that the vision and goals are consistently revisited and reassessed to address a region's changing needs to support a region's desired transportation direction. Given the scale and longevity of transportation investments and the impact they may have on a region's economy and quality of life, improvements to the transportation system demand deliberate and thoughtful planning. A realistic long range plan is critical in helping a region realize its vision for the future.

Clarification of purpose and need should be defined during problem identification in the LRTP. A need is a tangible, fact-based problem which establishes evidence of a current or future transportation issue, is factual and quantifiable, justifies commitment of financial resources and impacts to the environment, identifies a problem that is fixable or solvable, and establishes logical termini.

The purpose is what the problem is intended to accomplish. A problem's purpose is an overarching statement as to why the proposal is being pursued and the objectives that will be met to address the transportation deficiency. The level of specificity for defining purpose should be considered in relation to how that may impact the number or range of alternatives that will be developed. The purpose and need should not be defined so narrowly as to artificially limit the range of alternatives considered, particularly those problems that may require an Environmental Impact Statement or Environmental Assessment. Elements of a problem's purpose include that it can be used to develop and evaluate potential solutions, is achievable, is unbiased, is comprehensive enough to allow for a reasonable range of alternatives and specific enough to limit the range of alternatives, and allow for a range of alternatives that are in context with the setting.



# Linking Planning and NEPA

## RESOURCES:

### Screening Forms

Problems advanced from the assessment to the identification stage are studied further and additional data is collected and documented on the Level 2 Screening Form by the MPO/RPO. This allows for additional evaluation in terms of the community context and consistency with regional, state and national goals. Also, this permits problems to become more clearly defined in terms of need and alternatives are identified and compared prior to their inclusion in the LRTP. This analysis will also identify any high level engineering issues that may effect the range of costs anticipated for the problem.

The Level 2 Screening Form should provide more detailed information on the problem area's land use; community context; environmental, historical, and cultural impacts; updated information on potential solutions or approaches; and updated costs and funding information. The desired outcome of this stage is the identification of the problem on the regional LRTP's prioritized project list which provides a clear balance between short range (TIP) and long range (LRTP) goals. However, some problems may be deferred or require additional definition.

Prioritization and selection of problems in LRTP is a challenging task that requires the balancing of needs, resources, and priorities across many political jurisdictions. The selection cannot be solely driven by rigid rules, however, it is necessary to meet basic minimum criteria to remain aligned among regions, and with state and federal rules, regulations, and policies. A balanced fiscal plan is also critical when evaluating needs in the LRTP. MPOs and RPOs should work with partners to develop a list of prioritized proposals and programs suitable for evaluation as part of the planning process and adopt them into their LRTP. (Guidance for project prioritization and selection is located in Section III and **Appendix C.**)

#### **Problem Identification Activities:**

Clarification of problem purpose and need

Preparation of the LRTP draft

Application of selection and prioritization criteria (**Appendix C**)

Coordination with PennDOT Districts and Central Office

Cultural, historical, and environmental resource issues identification and mapping

Municipal, multimunicipal, and comprehensive plan coordination

Coordination with advocates of problems not advanced

Adoption of the LRTP project list



# Linking Planning and NEPA

## RESOURCES:

### Screening Forms

#### **Proposal Initiation and Definition (Project Delivery Step 3 and 4)**

Problems included in the LRTP project list may not have significant impacts to resources and may be within existing right-of-way. These problems often include highway and bridge preservation activities and technology such as ITS, data collectors, message boards, or radios. These problems can be advanced directly from project identification to consideration for inclusion on the TIP and the STIP without additional analysis. However, more complex problems that have been identified in the LRTP will advance to the proposal initiation stage as the next step toward inclusion in the TIP and the STIP. In either case the LRTP can provide specific data to support the project delivery process.

The MPO/RPO Technical or Coordinating Committee in each region reviews the Level 1 and 2 Screening Forms, as part of the Proposal Initiation phase, for completeness and make the preliminary determinations on the necessary level of documentation and public outreach. Each Technical or Coordinating Committee should include the appropriate PennDOT District and Central Office representatives, County and Municipal officials, and technical experts to assist in making the preliminary determinations of whether a proposal is suitable for advancement.

If additional study is required a Level 3 Screening Forms should be completed to provide further analysis of the potential impacts to environmental, societal, and cultural resources; bicycle and pedestrian issues; conceptual engineering; public participation; and additional coordination activities, as well as, documents cost estimates.

The Program Advisory Committee (PAC) will receive recommendations for advancement of specific study or project proposal from MPO/RPO Technical or Coordinating Committees to review the need for and scope of further study, evaluate the financial impacts and investment strategies, and make a recommendation to the MPO/RPO for further action. The PAC is comprised of the PennDOT Deputy Secretaries for Highway Administration and Planning and the affected PennDOT District Executive and MPO/RPO Executive Director or their designees.

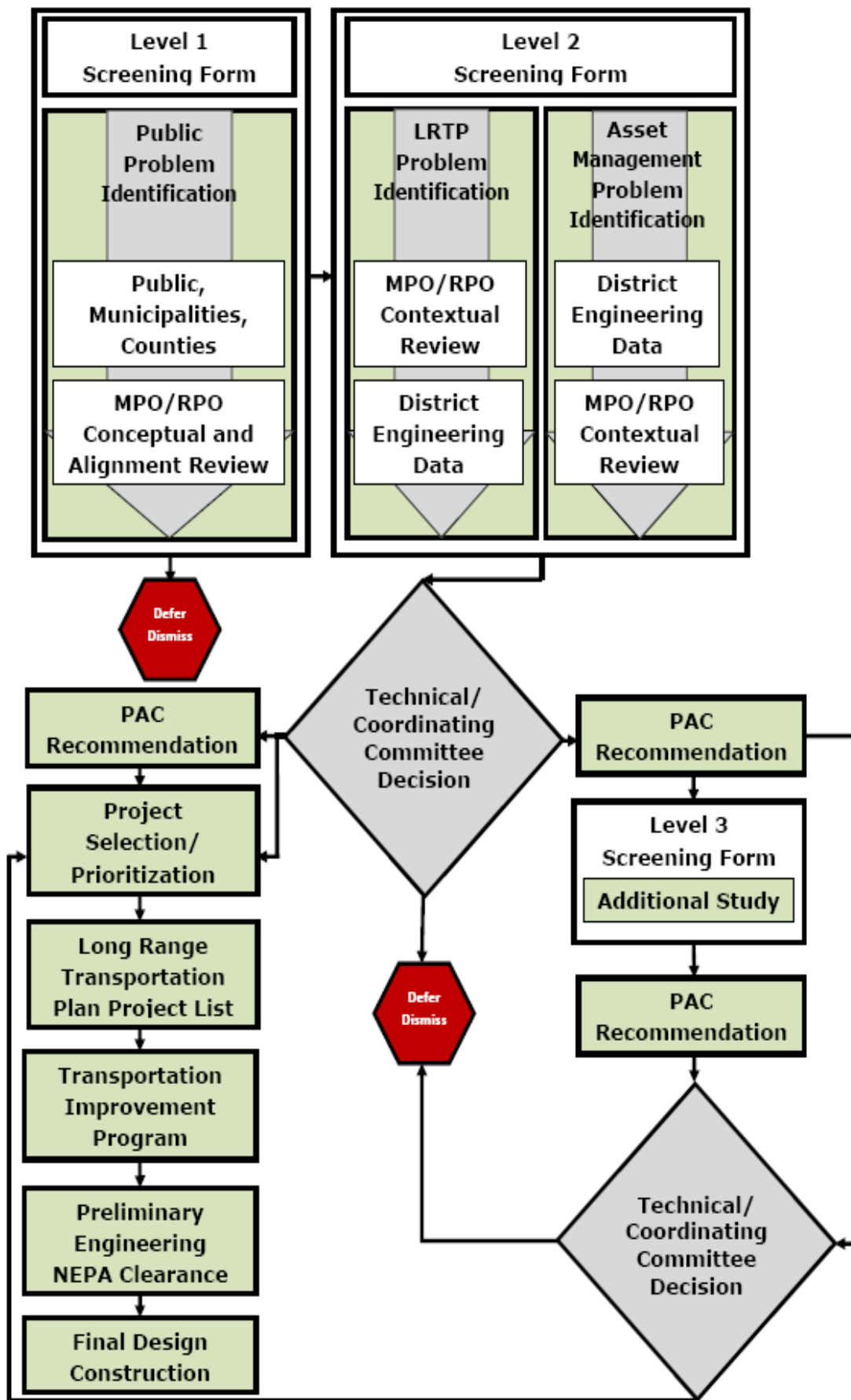
As a problem advances through the Proposal Definition Phase, the MPO/RPO has the responsibility and authority to identify those proposals or projects that should be collaboratively discussed with the PAC. Then, after receiving the recommendation(s) from the PAC, proceed with deferment or funding additional studies. The PAC is reengaged at the conclusion of the studies to determine whether adequate consideration has been given to problem alternatives prior to TIP consideration. Here again the MPO/RPO Technical/Coordinating Committee has the authority and responsibility to defer or identify the problem as a project on the LRTP or TIP.



# Linking Planning and NEPA

## RESOURCES:

Screening Forms







# Documenting for the NEPA Process

## RESOURCES:

[PA Spatial Data Access \(PASDA\)](#)



[AASHTO Defining the Purpose and Need and Determining the Range of Alternatives for Transportation Projects](#)



For studies, analyses or conclusions from the transportation planning process to be used in the NEPA process, they must meet certain standards established by the NEPA. The information and products coming from the planning process must be sufficiently comprehensive that the Federal government may reasonably rely upon them in its NEPA analysis and documentation. Transportation planning processes vary greatly from locality to locality. Some transportation planning processes will already meet these standards, while others might need some modification to do so.

The NEPA calls for a Purpose and Need statement to briefly specify the underlying purpose and need to which the agency (MPO/RPO) is responding in proposing alternatives including the proposed action. A Purpose and Need statement can be derived from the transportation planning process.

Example of Needs	Example of Purpose
There is existing congestion on the roadways serving the subject area this is projected to worsen in the future.	The purpose of the proposal is to provide transportation mobility and safety improvements, relieve further congestion, and provide east-west access and mobility in the circumferential corridor south of the city.
There are safety concerns because of deficiencies in the roadway network.	
There is poor east-west mobility for truck access to redevelopment sites in the region.	
There is no circumferential transit service.	
There is poor east-west mobility from the region to the international airport.	

### Guidance for Establishing the Purpose and Need Statement in Planning

Should be a statement of the transportation problem (not a statement of a solution).

Should be specific enough so that the range of alternatives developed will offer real potential for solutions to the transportation problem.

Must not be so specific as to "reverse engineer" a solution.

May reflect other priorities and limitations in the area, such as growth management, land use planning, and economic development.



# Documenting for the NEPA Process

## RESOURCES:

[Integration of Planning and NEPA Processes](#)

Planning-based analysis of alternatives can be forwarded into the NEPA process, when the planning process is used to screen or narrow the range of alternatives either, by excluding certain alternatives from detailed study based on good documentation or by prescribing modes or corridors for transportation development which can result in eliminating alternative modes or corridors from detailed study again, based on good documentation.

### **Guidance for Screening or Narrowing the Range of Alternatives**

Should describe the rationale for determining the reasonableness of the alternative or alternatives.

Should include an explanation of why an eliminated alternative would not meet the purpose and need or was otherwise unreasonable.

Should be made available for public involvement during the NEPA scoping process.

FTA may also narrow the alternatives considered in detail in the NEPA analysis and documentation to the No-Build (No-Action) alternative and the "Locally Preferred Alternative."

### **Guidance for Eliminating Modal Choices from Detailed Study before the NEPA Review**

During the planning Alternatives Analysis, all of the reasonable alternatives under consideration must be fully evaluated in terms of their transportation impacts, capital and operating costs, social, economic, and environmental impacts, and technical considerations.

There must be appropriate public involvement in the planning Alternatives Analysis.

The appropriate Federal, State, and local resource agencies must be engaged in the planning Alternatives Analysis.

The results of the planning Alternatives Analysis must be documented.

The NEPA scoping participants must agree on the alternatives that will be considered in the NEPA review.

The NEPA document must incorporate by reference the evaluation of alternatives from the planning Alternatives Analysis.



## Documenting for the NEPA Process

### **Long range planning activities that can be used for Proposal Initiation and carried forwarded to Preliminary Design for the NEPA Process:**

Completed Level 1 and 2 Screening Forms

Regional development and growth analyses

Population and employment projections, and demographic trends and forecasts

Geographic Information Systems (GIS) overlays showing the past, current, or predicted future conditions of the natural and built environments

Environmental reviews that identify resources and sensitive areas from existing mapping and inventories

Descriptions of airsheds and watersheds

Projections of future land use, natural resource conservation areas, and development

Establishing community context

General travel corridor or general mode definition

Travel demand forecasts

Documentation of the problem statement

Preliminary screening/elimination of alternatives

Results of public, resource agency, and stakeholder involvement

Design concept and scope descriptions of all existing and proposed transportation facilities

For major transportation investments for which analyses are not complete, indicate that the design concept and scope (mode and alignment) have not been fully determined and will require further analysis



# PLANNING COMPONENTS



# Trends, Issues, and Implications

## RESOURCES:

### American Community Survey



### A Guidebook for Using American ACS Data for Transportation Planning



### Northern Tier Regional Planning & Development Commission



### DVRPC Trends and Forces



## Trends, Issues, and Implications:

When developing a long range plan, it is critical to analyze probable future conditions and how these will affect the transportation system and transportation needs. Providing information on trends and, where possible, projections, serves to better inform both regional partners and decision-makers about critical long-term issues. In many cases this information is collected as part of ongoing monitoring efforts. To the greatest extent possible, planning partners should use existing sources of data to minimize primary data (mapping, and inventories) collection and analysis. Understanding the trends, issues, and the identification of potential implications provides needed context and is vital to developing an appropriate plan vision, goals, and objectives.

Trends, Issues, and Implications
Demographic data
Economic indicators
Development patterns
Travel demand (trips, vehicle-miles-traveled ridership, mode share)
Mode choice (i.e., transit, bike, pedestrian, etc.)
Travel patterns
Goods movement and trucking
Safety (types of accidents and accident rates)
Operational performance
Congestion and delay
Environmental impacts – air quality, water
Energy consumption
Infrastructure condition
Construction costs
Productivity and efficiency
Funding and finance
ADA compliance
Marcellus Shale



# Inventories

## RESOURCES:

[Bureau of Transportation Statistics](#)



[Lebanon County Transportation Profile](#)

[UNJAM 2025: Existing Transportation System](#)



## Regional Inventories:

An inventory of transportation facilities and an assessment of its capacity to serve its users provides a snapshot from which an MPO or RPO can begin to identify sufficiencies and deficiencies in the system both in terms of maintenance and capacity. Including historic and forecasted user demand of the transportation facilities and a discussion of need and opportunities helps to plan for a more sustainable and livable future for a region. In addition, an overview of the region's natural, historical, and cultural resources and identifying potential conflicts and mitigation opportunities early in the long range planning process can create a stronger linkage to the planning and project development processes. MPO and RPO should collaborate with the appropriate PennDOT District (s) and Central Office to identify resources to complete the inventories.

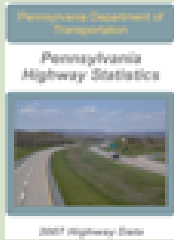




# Inventories

## RESOURCES:

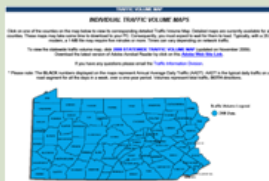
### PA Highway Statistics



### MPMS



### PennDOT County Traffic Volume Maps

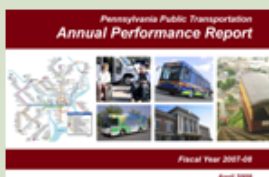


### Bridge Information

### Public Transportation Services and Programs Map



### Public Transportation Annual Performance Report



## Transportation Inventories:

The major elements of the existing transportation system should be documented. This information can be easily inventoried within a geographic information system, if available. In many cases this information may be available for free from PennDOT or other providers. Elements that should be documented are highway, bridges, local streets and roads, public transportation, ITS and traffic signals, goods movement (ports, rail, trucking and aviation), trails, bicycle and pedestrian facilities, and other major transportation hubs. In addition, regions should inventory the existing NHS Intermodal connectors (where applicable) and identify any facilities that should be added. To assist regions an intermodal connector assessment tool has been developed and is located in **Appendix A**. Once documented, this information can be presented both graphically via mapping and descriptively in tables. Once the key elements of the system are documented, subsequent plan updates require only reviewing and updating this work.

### Highways, Bridges, Local Streets and Roads

An overview of the bridges, primary highway and arterial road system including the National and State highway system, and regionally significant streets and roads within the region. NOTE: Regions should delineate between those facilities eligible for federal-aid including locally owned roads on the federal-aid system and local bridges greater than 20 feet in length from other significant locally owned facilities.

### Public Transportation

- Identification of passenger transit modes within the region (bus, light and heavy rail, etc.).
- Integration with transit, highway, street and road projects (including identification of priorities and consideration of transit oriented design).
- Operational integration between transit fleets, and other modes (passenger rail, aviation, taxis, etc.).
- Short and long range transit plans and capital finance plans for the LRTP period.
- Inventory of bus fleets by "age" and fuel type (diesel, natural gas, and other alternative fuels).
- Urban and commuter rail project priorities.



# Inventories

## RESOURCES:

### Traffic Signal Locations



### FHWA Freight Analysis Framework



### National Highway System Freight Connectors

### Guidebook for Integrating Freight into Transportation Planning and Project Selection Processes



## ITS and Traffic Signals

An overview of the region's existing ITS infrastructure including those that increase efficiency, safety, and level of service.

An overview of the region's existing and proposed Traffic Signals.

## Goods Movement/Intermodal Linkages (Ports, Rail, Trucking, and Aviation)

The role of goods movement within the region (this general discussion will include intermodal connectivity between all applicable maritime facilities, rail freight lines, inventory of major routes used for trucking, major warehouses and freight transfer facilities, and aviation cargo facilities).

Identification of NHS Intermodal Connectors/Intermodal Connector Assessment (PA ICAT) located in **Appendix A**.

Plans for future expansion of ports and airport cargo handling facilities and issues regarding access to these ports.

Projections for future expansion of rail freight lines within the region.

Rail, airport, and port access issues (if applicable).



# Inventories

## RESOURCES:

### Pennsylvania Public Airports



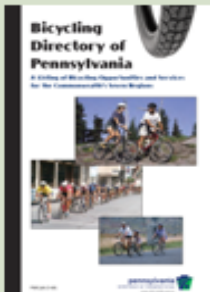
### FAA Passenger Boardings and All Cargo Data



### PennDOT Bicycle and Pedestrian Information



### Bicycling Directory of Pennsylvania



### PA Outdoor Recreation Plan



### Transportation Enhancement Activities

## Regional Airport System

An overview of the role the airport system within the region.

An airport inventory of the commercial and general aviation airports within the region. This should include a general description of each airport (number of commercial flight, based aircraft, number of annual operations, etc.).

Short and long range capital improvement plans and projects for the airports within the region.

Outcomes of the State Aviation System Plan (SASP) update and regional aviation system planning efforts.

## Trails, Bicycle, and Pedestrian

An overview of the bicycle and pedestrian facilities in the region and volumes where available. (include agency/municipality responsible for the facility).

Policies, plans and programs used to promote the usage of bikes and walking.

Transit interface with trails, bicyclists and pedestrians.

Identification of Transportation Enhancements, Home Town Streets, and Safe Routes to School activities and identify missing links on the network.



# Inventories

## RESOURCES:

[PA Spatial Data Access \(PASDA\)](#)



[PennDOT Cultural Resources](#)

[PHMC Cultural Resources GIS](#)

[DEP GIS](#)

[DCNR GIS](#)

[PA Fish and Boat Commission GIS](#)

[ESRI TIGER Line Data Census 2000](#)



[Integrating Climate Change into the Transportation Planning Process](#)



## Environmental Inventories:

Natural, historical, and cultural assets should be documented. This information can be inventoried within a geographic information system, if available. In many cases this information may be available for free from the Pennsylvania Historical and Museum Commission, the Pennsylvania Department of Conservation and Natural Resources, the Pennsylvania Department of Environmental Protection, the Pennsylvania Fish and Boat Commission or other information providers. Once documented, this information can be presented both graphically and descriptively in tables.

### Environmental Overview: Natural, Historical, and Cultural Inventories

A general overview and documentation of natural/historical/cultural resources. See **Appendix D** for Environmental Resource GIS Data Sources.

Potential impacts associated with improvements to the transportation system as well as conceptual mitigation opportunities.

Potential impacts associated with natural gas drilling as well as conceptual mitigation opportunities.

A general overview of all existing and future regional greenways and trails including water trails.

Specific resources agency coordination measures.



## Visioning/Transportation Goals & Objectives

The purpose of developing a vision is to clearly articulate a desired overall direction for the region. This vision can then be further defined through more specific goals and objectives. The vision, goals, and objectives should then be supported throughout the plan, particularly when evaluating and prioritizing solutions. The vision should take into account the overall desires and aspirations of the community, and include a variety of factors beyond transportation that may influence the region's transportation solutions. This broad vision can then be translated into the transportation-related goals and objectives that set the direction for more specific aspects of the plan. The development of a vision, goals, and objectives needs to be inclusive and should occur primarily through a strong public involvement and outreach process in order to adequately address the needs of the public for which the future transportation system is intended to serve. In addition, linking the information in the previous plan to the new plan update provides for some level of continuity. This is particularly an issue when there are unresolved concerns from the previous plan, which can often be the case given the short time between new plans. Integrating external policies into the vision process is also an important consideration, since part of the purpose of visioning is to factor non-transportation issues and policies into the transportation plan.

During the visioning process and the identification of goals and objectives regions may want to consider the concepts of livability and sustainability. Livability is about tying the quality and location of transportation facilities to broader opportunities such as access to good jobs, affordable housing, quality schools, and safe streets. This includes addressing safety and capacity issues on all roads through better planning and design, maximizing and expanding new technologies such as ITS and the use of quiet pavements, using Travel Demand Management approaches to system planning and operations, etc. Environmental sustainability is providing for the quality of human life while living within the innate carrying capacity of the Earth's eco-systems. It is the intentional act of conserving the Earth's natural resources for future generations to the maximum extent possible while addressing both present and future economic and social needs. People must wisely choose the best alternatives that impact the Earth's natural resources the least. Such impacts must be understood and managed with a holistic consideration of the interaction and interdependency between biological and human activity across local, national, and global scales. Ecological equity requires such consideration for all walks-of-life, all generations and across all geographies. At its core, sustainability requires both quality of human life and wherever possible the wise use of renewable, reusable and recyclable resources to reduce the unnecessary consumption of natural resources. By embracing these themes, a region can realize the potential of creating more transportation options at a lower cost.

### **Core Federal Livability Principles**

- Economic Competitiveness
- Coordinated Policies and Leveraging of Investments
- Safe and Efficient Access to Jobs, Education, Health Care, and Goods and Services
- Mixed Use, Mixed-Income, Compact and Infill Development
- Increased Modal Options (Transit, Pedestrian, and Bicycle) and TODs
- Equitable and Affordable Housing
- Value of Community Character and Public Involvement



# Financial Planning and Guidance

## RESOURCES:

[Long range plan 28 year financial guidance for each MPO and RPO](#)

[FHWA: Innovative Financing](#)



[FHWA: Public-Private Partnerships](#)



[DVRPC: Options for Filling the Region's Transportation Funding Gaps](#)



As required by federal regulations, the long range plan must be fiscally constrained, based on an analysis of revenues that can reasonably be expected over the chosen planning horizon. Partners should establish the LRTPs fiscal constraint in coordination with PennDOT and federal representatives, not only to better predict future funding streams, but also to provide for some level of consistency within the state. It is unlikely that most regions will have sufficient funding to meet all their desired solutions with traditional sources of funding. Regions may need to explore alternative funding sources, whether through leveraging private transportation investments, public-private partnerships, innovative financing mechanisms, or alternative revenue sources, and determine how they could realistically be incorporated into a region's transportation plan. Providing an opportunity to list out solutions that are outside the financial guidance allows for a comparison of the benefits and drawbacks of various revenue-enhancing options.

The baseline fiscal constraints were determined by the Financial Guidance Work Group and follows the latest TIP/STIP Financial Guidance formulas.

Discretionary funding such as spike and economic development may be estimated using a historical average. Existing earmarks for projects can be listed in the Long Range Plan, if full project funding can be documented. Appalachian Development funding may also be included for currently approved projects as reflected in the latest cost to complete estimates.

The funding estimates provided are a best estimate based on the current financial and political climate at the Federal and State levels. If an MPO or RPO chooses to use other funding estimates, documentation of how these estimates were generated must be provided. The estimates must be within reason, and consultation with PennDOT Center for Program Development and Management and FHWA is required before alternate estimates are used.

An inflation factor is available through the PennDOT Office of Planning. This factor should be applied to current year estimates and compounded annually to determine future costs by the year of expenditure (YOE).





# Asset Management

## RESOURCES:

[Transportation Advisory Committee: Transportation Funding Study](#)



[AASHTO Transportation Asset Management Today](#)

[FHWA Asset Management Home](#)



[FHWA Integrating Asset Management into the Metropolitan Planning Process](#)



[York County Long Range Transportation Plan](#)



[General and Procedural Guidance](#)

Planning for long range asset management identifies the appropriate level of available resources that should be allocated for the preservation of the existing transportation system. Having a consistent method and tools to estimate the cost of maintaining and improving the transportation infrastructure region's can direct resources to where they are needed and identify funding shortfalls.

Long range plans need to reflect stated policy objectives. Short term operational planning and capital programming need to translate policies into performance objectives to match planning decisions with strategic priorities. A failure to invest available resources properly in managing assets will result in the further deterioration of the system.

The objective is to provide better decision-making based upon quality information and well-defined objectives. It is important for MPOs and RPOs to emphasize asset management planning as part of their LRTP process in a more comprehensive manner. A key goal is to begin thinking about maintaining the existing system as early as possible in the planning process and allocate capital funding to projects that will extend the useful life of the existing system and make the most cost-effective improvements to the system.

Regional LRTPs should be consistent with the identified statewide maintenance goals in the General and Procedural Guidance, "Transportation system preservation and management continues to be the highest priority in Pennsylvania and the individual MPO/RPO programs should emphasize system preservation and management. System preservation involves extending the life of existing facilities and their associated equipment and hardware or the repair of damage that impedes mobility or compromises safety; while, system management involves improving the reliability, safety, traffic flow, and security of existing facilities and their associated equipment and hardware."

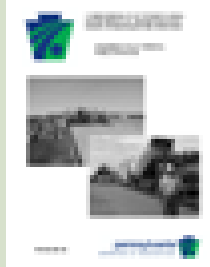
The current TIP/STIP General and Procedural Guidance recommends, "that at a minimum of 90% of a MPO or RPO's program be dedicated to system preservation including 85% of bridge improvement resources directed toward addressing structurally deficient (SD) bridges," in order to reduce the backlog of structurally deficient bridges. The remaining 15% should be directed toward bridge preservation once the number and deck area of structurally deficient bridges has reached established goals for each network and the top statewide quartile of SD bridges (as per PennDOT's Bridge Risk Assessment Tool) within the region is programmed on the TIP, a higher percentage of funds can be invested in bridge preservation and non-SD bridges to prevent additional bridges from becoming SD. This approach reflects a statewide goal to achieve 8.3% SD deck area by 2033, while extending the life of the bridges that are not currently SD.



# Asset Management

## RESOURCES:

[Pavement Policy Manual: PUB 242](#)



Assets to be included in LRTP preparation are: pavements on all state and local federal-aid routes; bridges (including all federal eligible bridges over 20 feet and state and local bridges between 8 and 20 feet); tunnels (if applicable); ITS; traffic signals; and public transportation facilities and equipment. Guidance and methodology for considering each of these assets and for determining resource requirements to maintain these assets in a steady state condition and reduce the backlog in each of these areas are presented in **Appendix B**.

### Asset Condition and Needs

Description of the current condition and performance of the transportation

Evaluation of the current system to determine the resources needed to sustain quality infrastructure

Financial need estimates developed for each asset compared to total available funding

Documentation of the funding shortfall needed to sustain quality infrastructure

## Pavement

Significant progress has been made in improving the smoothness of Pennsylvania pavements over the past several years. The International Roughness Index (IRI) is a measure of highway roughness, with lower numbers indicating smoother pavements. In 2009, Pennsylvania's 1,700-mile network of interstates carried 24 percent of all the state's traffic on only 1.5 percent of the state's total roadway network. As a unit, these roadways recorded the lowest (best) IRI ratings, successively followed by lower-order roadways, such as National Highway System (NHS) and non-NHS routes. Based on the IRI values, the interstates can be classified as in "excellent" condition, while the other networks are rated "good".

However, approximately 6,800 miles of road remain in poor condition and smooth pavements may not translate into durable, long lasting pavements. Much of Pennsylvania's underlying pavement structure has exceeded its design life and there are significant reconstruction and rehabilitation needs. Additionally, there are substantial roadway appurtenances (signs, drainage structures, safety hardware, etc.) which require periodic replacement. A comprehensive asset management system would include the right mix of pavement preservation and reconstruction projects. The result is that subsequent preservation treatments would be more effective and last longer. However, without additional funding, there will be more sealing and patching instead of resurfacing and reconstruction, resulting in further deterioration in overall pavement condition.



# Asset Management

## RESOURCES:

[Annual Pavement and Appurtenance Needs by County](#)

An effective pavement management system provides for the assessment of pavement condition, the prediction of future performance and the generation of reconstruction and preservation strategies that maximizes long term pavement serviceability based on well defined goals and available funding. Pavement management goals may place a higher emphasis on high type roadways such as the Interstate but should not neglect other categories of roads. A balance of preservation and reconstruction or rehabilitation projects is required to assure that while some roadways are improved, others are not allowed to deteriorate extensively.

PennDOT has assessed current and future pavement needs based on current condition, predicted IRI, and treatment cycles and proposed a scenario to improve the overall pavement condition. It is critical that pavements be addressed on a treatment cycle which includes eventual reconstruction of the pavement based on observed conditions. The proposed cycle for Interstate and NHS pavements addresses pavement reconstruction at the 50-year mark with maintenance activities and interim treatments (such as resurfacing or crack sealing) at the appropriate points within the 50-year cycle. For the lower level networks, a similar cycle is proposed with a less expensive treatment such as a full betterment at the 50-year mark on Non-NHS roads greater than 2,000 ADT or a continuous seal coat cycle with paving on the most critical portions of the Non-NHS roads less than 2,000 ADT.

**Appendix B** shows the annual required funding to address the proposed pavement cycles for each network. These figures include annual pavement needs based on this cycle plus a plan to reduce the backlog of reconstruction needs over a 25-year period. In addition, appurtenance needs were included for the non-NHS network. This would include items such as signs, guiderail, paint lines, delineators, retaining walls, lighting and drainage.



## Methodology

- The recommended reconstruction/betterment and preservation cycles for state owned roadways were established to maintain the system at the current condition. A 50-year pavement life was assumed so all facilities would be reconstructed once during that period and the NHS facilities would be preserved three times during that period.
- The recommended cost per mile for reconstruction/betterment and preservation were established to facilitate planning for assets statewide. Unit costs and mileage may be obtained from **Appendix B**.
- Consult with the Bureau of Planning and Research to identify mileage of locally owned roads eligible for federal aid and apply the appropriate cost and treatment cycle as identified in the methodology in **Appendix B**.
- An inflation factor is available through the PennDOT Office of Planning. This factor should be applied to current year estimates and compounded annually to determine future costs by the year of expenditure (YOE).

Maintenance Planning Factors for Pavement		
Measure	Indicator	Level of Detail
IRI by Network	(% Excellent + Good)/ % Poor	County
Backlog	Miles Out of Cycle	County
OPI by Network	TBD	County
STAMPP by Segment	Total Dollar Needs	County
Source: PennDOT Bureau of Maintenance and Operations		
Note: See glossary for acronyms and definitions		



# Asset Management

## RESOURCES:

### Accelerated Bridge Program



## Bridges

Bridge conditions in Pennsylvania have long been a concern. The Commonwealth's Rebuild PA initiative emphasizes addressing the enormous bridge problem across the state. This includes bridge rehabilitations and replacements as well as preservation and maintenance to defer more bridges falling into the structurally deficient category each year. Positive progress has been made possible by dedicating most Act 44 funds to bridges, using bond proceeds for bridges, and dedicating any available highway funds to bridges.

PennDOT has proposed a new bridge initiative with the goal to reduce the percentage of structurally deficient bridge deck area to the national average within 10 years and to 5 percent over a 20 year period. It has been estimated that to accomplish this goal, 500 bridges would be rehabilitated or replaced annually for the first 10 years, with emphasis on the bridges on the National Highway System. This total could be reduced to 300 bridges for each of the following 10 years. This would assume that revenues to this program would keep pace with inflation. In addition, it is recognized some areas have a low level of structural deficient bridges and the emphasis needs to be preservation.

An effective asset management strategy for bridges centers on the most appropriate treatment strategy including routine maintenance, rehabilitation, and reconstruction based on recent bridge inspections and the Bridge Risk Assessment Tool outputs.



# Asset Management

## RESOURCES:

Annual Bridge  
Needs by County

## Methodology

- For the purpose of the LRTP, the needs assessment should include all state bridges greater than 8 feet and local bridges greater than 20 feet and not just those that are structurally deficient. This approach focuses on the advantages of asset management as it relates to preventative maintenance. By maintaining non-structurally deficient bridges their life can be extended before they need replaced.
- Inventory all structures using the Bridge Management System (BMS) from the PennDOT Bureau of Design and calculate the total square footage by county. A 20% contingency factor may be added.
- Obtain the recommended preservation activities and unit costs from **Appendix B** to determine need for the LRTP planning period. Utilize the Bridge Risk Assessment Tool to determine the recommended nearer term maintenance approach from the appropriate PennDOT District(s).
- An inflationary factor is provided through the PennDOT Office of Planning. This factor should be applied to current year estimates and compounded annually to determine future costs by the year of expenditure (YOE).
- Inventory all locally-owned bridges greater than 8 feet and less than 20 feet. The inventory should include structural type, an estimate of the deck area, and general condition, particularly if a routine inspection report is not available and obtain the recommended preservation activities and unit costs from **Appendix B** to determine need for the LRTP planning period.

### Maintenance Planning Factors for Bridges

Measure	Indicator	Level of Detail
SD by Network	% SD	County
SD Deck Area by Network	% SD Bridges Deck Area	County
\$ Spent on SD Bridges by Network	% of \$ Spent on SD	County
Change in SD Condition	% Change in SD Condition	County
Source: PennDOT Bureau of Design		



## Tunnels

A tunnel is an underground highway that in many cases is equipped with a conglomerate of interrelated systems and components that need to be properly inspected, maintained, and tested to insure the tunnel is open and performing reliably as designed. A preventive maintenance plan, which considers future upgrading of systems should be developed. Decision makers/owners can then provide the necessary capital expenditure budget to insure the continued viability of the tunnel and its supporting systems.

## Methodology

- For the purpose of the LRTP, the owner should perform a needs assessment, which should include cyclic maintenance and replacement of key life-safety and structural components, and identify and establish target levels of condition, system reliability, and performance for each tunnel. Employing these standards and evaluating the cost of preserving the long-term viability of tunnels can be used to calculate funding requirements over the period of the LRTP.
- The financial management plan for tunnels should not only include costs for rehabilitation, but should also address future preservation and required enhancements to meet new emerging requirements for life-safety. Agencies should work with local planning organizations to accomplish this task.
- Tunnel systems are generally complex and expensive in terms of capital costs. The use of peer review teams and technical advisory panels with subject matter expertise should be considered in developing site-specific criteria and best practices.
- An inflationary factor is provided through the PennDOT Office of Planning. This factor should be applied to current year estimates and compounded annually to determine future costs by the year of expenditure (YOE).





# Asset Management

## RESOURCES:

[Management and Operation in the Metropolitan Transportation Plan](#)



[511PA](#)



[Annual Pavement and Appurtenance Needs by County](#)

## ITS Assets

Congestion is a result of several root causes including physical bottlenecks, traffic incidents, traffic signals, work zones, weather, and special events. Nationally and in Pennsylvania, congestion has worsened over the past 20 years. It is estimated that congestion costs Pennsylvanians \$2.7 billion each year according to the Texas Transportation Institute. Conservative estimates indicate that congestion will increase by 50 to 60 percent in Pennsylvania by 2035 unless a multifaceted congestion mitigation program is established.

ITS technology has been deployed on the heaviest travelled highways in Pennsylvania. \$13.6 million is spent annually to operate and maintain ITS equipment and Regional Traffic Management Centers (RTMC) across the state. In addition, specific projects are programmed across the state to add ITS equipment, either as standalone projects or as part of larger projects. To provide traveler information, 511PA data is compiled from public sources including PennDOT, PA Turnpike traffic operations, Pennsylvania Emergency Management Agency (PEMA), and Pennsylvania State Police (PSP). As part of 511PA, traffic speed data is purchased from a private supplier for 488 miles of Interstates and expressways.

With the growing amount of ITS equipment already deployed across the state, it is necessary to begin a replacement program for old or outdated equipment. This is currently estimated to cost \$74 million per year in 2010 dollars. **(Appendix B).**

Asset management for ITS consists primarily in budgeting for equipment upgrades, repairs, and replacements. Typical life-cycles for ITS assets vary considerably due to the wide range of device types and operational conditions. The nature of ITS equipment requires fairly frequent maintenance and replacement as compared to more traditional assets like roads, bridges, and static signs. Moreover, an ITS asset may become outdated if its functional requirements change prior to the asset's useful service life. These costs should be included in LRTP budgeting.



## RESOURCES:

### Traffic Signal Resource Portal



## Methodology

- The MPO/RPO should request an inventory of ITS devices by year of installation from the PennDOT Bureau of Highway Safety and Traffic Engineering and the appropriate replacement cycles through the plan horizon. The product will be the number of assets by ITS device type and the year that they were installed.
- The MPO/RPO should determine the ITS maintenance and replacement costs by multiplying the total number of devices by its operations and maintenance unit cost. Replacement costs should be added in the future planning years as appropriate based on the recommended replacement frequency.  
**(Appendix B)**
- An inflationary factor is provided through the PennDOT Office of Planning. This factor should be applied to current year estimates and compounded annually to determine future costs by the year of expenditure (YOE).

## Traffic Signals

Pennsylvania has nearly 14,000 traffic signals that are owned and operated by approximately 1,200 of Pennsylvania's municipalities. A majority of these municipalities have neither the technical expertise nor the resources to adequately maintain and operate their traffic signals. There is minimal operational oversight at the state level after initial installation. Improved operation of traffic signals could have a significant impact on major arterials and other corridors throughout the state. Traffic signal retiming has been shown to be one of the most effective ways to improve traffic movement and make streets safer. Retiming has benefits to the traveling public through reducing delay, reducing motorist frustration, improving safety, and reducing fuel consumption and emissions.

Identifying the costs associated to better time and modernize signals could reduce congestion and assist local governments. Based on recommended practices by the FHWA, traffic signals should be retimed at least every 5 years and modernized every 10 years. It is estimated to cost approximately \$182 million statewide annually in current dollars.



# Asset Management

## RESOURCES:

Annual Traffic Signals by County

## Methodology

- The planning partner should obtain the Department's inventory from the PennDOT Bureau of Highway Safety and Traffic Engineering and a review of traffic signal map locations at <ftp://ftp.dot.state.pa.us/public/Bureaus/HighwaySafety/Traffic%20Signal%20Maps/>.
- Review the Department's inventory and traffic signal map locations to determine discrepancies with the previous Department's traffic signal listing.
- Obtain the recommended preservation activities and unit costs from **Appendix B** to determine need for the LRTP planning period.
- An inflationary factor is provided through the PennDOT Office of Planning. This factor should be applied to current year estimates and compounded annually to determine future costs by the year of expenditure (YOE).

Maintenance Planning Factors for Traffic Signals		
Measure	Indicator	Level of Detail
# of Signals Maintained	% Maintained	County
# of Signals Retimed	% Retimed	County
# of Signals Modernized	% Modernized	County
Source: PennDOT Bureau of Design		

NOTE: A GIS shapefile containing the traffic signal locations is available through the PennDOT Office of Planning.



# Asset Management

## RESOURCES:

[FTA State of Good Repair](#)



## Public Transportation

Capital assistance is intended to keep current transit assets such as buses, rolling stock and fixed guideway infrastructure in a state of good repair. It is widely acknowledged that there are substantial shortfalls that will constrain transit providers' ability to maintain assets in a state of good repair and implement strategic capital improvements to address the demand associated with growing areas.

The LRTP should identify the need for transit asset management and account of it in financial projections. Those assets that are eligible to receive Federal funds to assist with modernization of transit fleet(s) and facilities should be included in the analysis. The intent is to capture the capital costs associated with maintaining and improving services over time.

## Methodology

- The MPO/RPO should request an inventory of the existing fleet by year of purchase from the public transportation provider(s) in the region. The product will be the number of assets by type and the year it was purchased.
- The MPO/RPO should contact the Federal Transit Administration and the public transportation provider(s) in their region to determine the cost associated with the modernization of their fleet(s) using appropriate replacement cycles up to the plan horizon.
- Similar data should be collected for transit facilities and fixed guideways based upon planned improvements or replacements.
- A capital cost escalator of 3 percent should be used for forecasting purposes. (NOTE: This is consistent with the assumption used by Transportation Funding and Reform Commission).
- NOTE: An update to these recommendations/methodology is expected to be completed in early 2011.

### Maintenance Planning Factors for Public Transportation

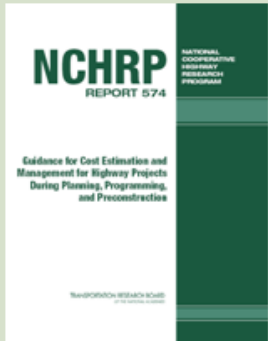
Measure	Indicator	Level of Detail
Average Fleet Age	% Past Useful Life	Transit Agency
Facility Condition/Capacity	Condition, Age, and Capacity	Transit Agency
Fixed Guideway Condition	Condition Analysis	Transit Agency
Source: Transit Service Providers/Bureau of Public Transportation		



# Cost Estimation

## RESOURCES:

### Guidance for Cost Estimation



### PennDOT Transportation Project Cost Management



### Screening Forms

Cost estimates are required for each phase of a project and are to be created as early as possible during the development of the Long Range Transportation Plan (LRTP) and during the project development process. The initial cost estimate should be identified in the Level 2 screening form. Updates during the project development process should occur at the project milestones of Problem Identification, Proposal Initiation, Proposal Definition, Project Identification in the Transportation Improvement Program (TIP), Preliminary Engineering/NEPA Decision (Design Field View), Final Design (Final Design Office Meeting), and Final Estimate. The cost estimate method used must fit the information available at the time the estimate is developed and take into account project complexity. Providing environmental information at the earliest possible point in time is consistent with Federal and State efforts to streamline project delivery and the NEPA review process. It is recommended that the LRTP also include preliminary cost estimation for mitigation activities that are identified. For projects of significant complexity, Environmental Assessments and Environmental Impact Statements, only the study phases should be on the LRTP until the project has been clearly defined. Transit cost estimates for capital improvements are to be created during the development of the LRTP and the project development process. Updates during the project development process should occur as required for TIP development, finalization of specification, and solicitation of bids in coordination with the appropriate transit agency.

Cost estimations must be based on work that can reasonably be accomplished over the planning horizon. Each project phase must be assigned to the appropriate segment of the LRTP project list. Project phases that are cash flowed must be based upon realistic milestones.

Consistent cost estimates can be developed through the Metropolitan Planning Organizations and Rural Planning Organizations in collaboration with the appropriate District Design Unit(s) or Transit Agency(s). All projects in the LRTP must provide accurate cost escalation factors (Year of Expenditure) while maintaining fiscal constraint.

#### **Cost Estimation Checklist**

Estimate is escalated to year of expenditure dollars for each phase of the project.
Process includes risk-based assessments of cost drivers and of unknown and all uncertain costs.
Estimate is consistent with project scope.
Estimate includes costs for each project phase.
Estimate includes all right-of-way and administrative costs.
Estimate includes all third party (e.g. utility, railroad) costs.
Estimate includes cost contingencies and known or potential risk factors.
Estimate includes inspection costs.
Other items may be added depending on the project's characteristics.

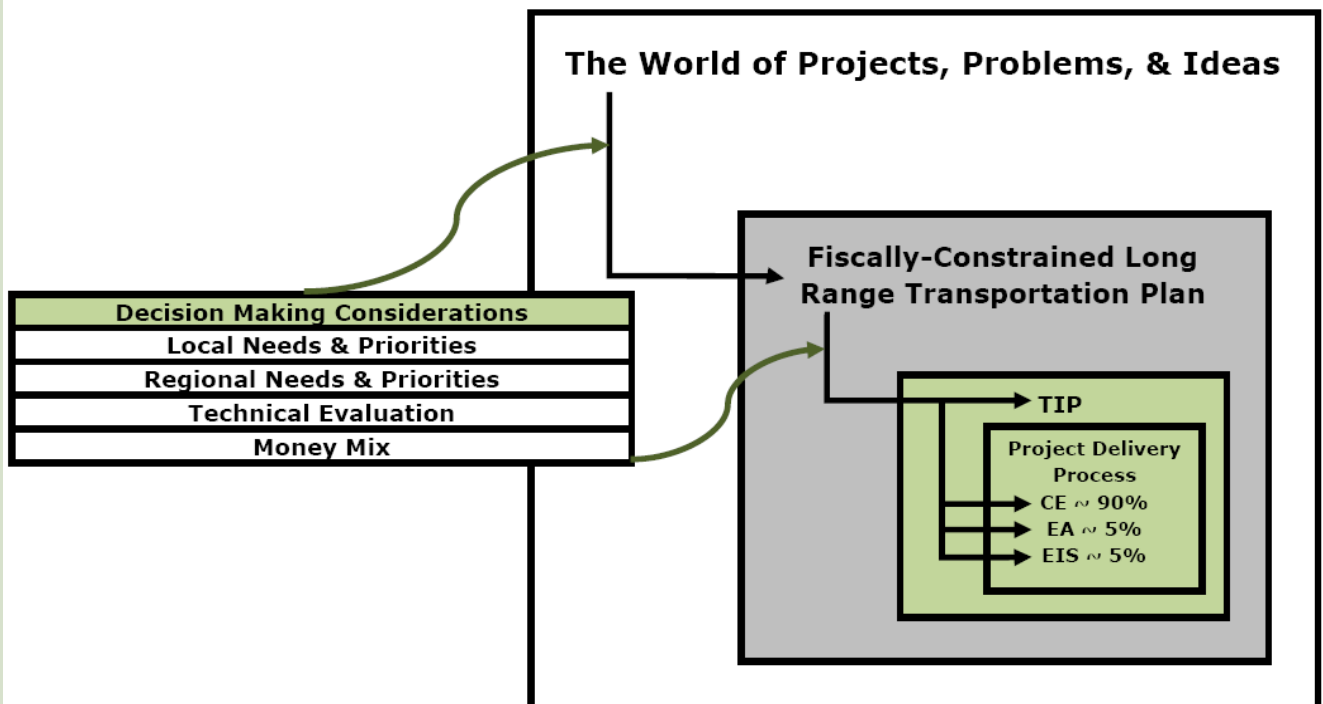


# Project Prioritization and Selection

Prioritizing transportation projects is essentially a three-step process. First, transportation system needs (problems) and project ideas (solutions) are identified through public involvement processes, County Comprehensive Plans, PennDOT District planning efforts, transit provider plans, freight carriers, economic development agencies and various other sources. Since financial resources will never be sufficient to address every problem, needs and projects must be prioritized. The second step is to identify needs and projects that are a high enough priority to be included on the region's fiscally-constrained long range transportation plan. The third step is to identify needs and projects that are a high enough priority to be included in Stage 1 of the plan, which corresponds to the short-range Transportation Improvement Program. Once these project are identified they proceed into the problem development and project delivery processes which includes environmental review, design and construction.

There are four basic considerations incorporated into the decision-making process at the key prioritization points: local needs and priorities, regional needs and priorities, technical evaluation, and the money mix. Recent efforts have focused on improving the technical evaluation component of this process in order to provide decision makers with better information from which to base their decisions.

Establishing a project selection process helps to provide consistency between the goals and policies implemented through plans and programs and the mix of projects and investments of the Transportation Improvement Program (TIP). Establishing a process during the Long Range Transportation Plan (LRTP) development process allows for a more robust collaborative effort including input from both the public and stakeholders. However, project prioritization is not a mechanical process. It cannot and should not be overly prescriptive or inflexible. The minimum project criteria located in **Appendix C** should be viewed as a baseline for identifying a process to evaluate projects. Additional criteria and the weights assigned for all the criteria should be considered per any feedback received during the public participation process.



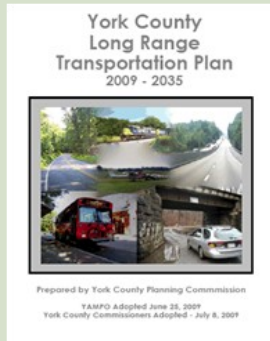


# Project Prioritization and Selection

## RESOURCES:

[Harrisburg Area Transportation Study Project Ranking Criteria](#)

[York County Long Range Transportation Plan](#)



The desired outcome is to create a better maintained system than under the current approach. Applying the Keystone Principles and Smart Transportation concepts helps to guide development, influence land use decisions, and mitigate the related impacts on infrastructure.

In addition to using the road management pavement cycles and the bridge risk assessment tool to help identify maintenance needs, Metropolitan Planning Organizations (MPOs) and Rural Planning Organizations (RPOs) may consider identifying targets based on measures like International Roughness Index (IRI) or percent structurally deficient (SD) bridge deck area that provide prioritization for all classes of assets. Measures can also consider highway safety, volume, land use, economic impact, and the population served. This approach recognizes that the total cost to maintain the current system will be several times the projected funding available and place a stronger emphasis on targeting investment decisions.

Developing two sets of criteria, one specific to the project type, for example highway or transportation enhancements (TE), and a second set which incorporates the smart transportation principles is recommended. The first set of criteria is relative to the type of project. This approach recognizes that the criteria used to select a good bridge project would be different from the criteria used to select a TE project. The project would then be sent through the second set of criteria used as a filter to determine if the proposed project meets certain requirements and has support from the community (i.e. smart transportation). Once the project has been scored by both lists of criteria, its overall score is used to rank it among like projects. The MPO/RPO will then have to determine the amount of funding that will be spent on each type of project and the ranked list can then be used to select projects up to the determined funding level.

GIS can also be used as a tool to assist in the selection of projects by providing greater context of the area. Overlaying candidate projects over current asset condition data may show which projects address the greatest areas of need. Also overlaying demographic data would help with the equitable distribution of projects across the communities in the region.

A guide to various project characteristics, criteria for project types, and overall transportation criteria can be found in **Appendix C**.





## Project Lists

In order for a project to be included in the regional Transportation Improvement Program (TIP), it must first be consistent with the most recent update to the long range transportation plan. To be in compliance, the long range plan must include a list of projects that may be implemented during its planning horizon. This project list must be fiscally constrained. However, it is becoming more common for additional projects to be included, either in a supplementary list or as part of a scenario in which additional transportation revenues will become available during the planning horizon (the projects are often referred to as an “illustrative list” of projects). Because the planning horizon is 20 years or more, different projects will be defined at varying levels of detail, ranging from near-term projects that are well defined and have reasonably accurate cost estimates, to long range projects that are likely to undergo changes in terms of scope and budget before approaching implementation. In some cases, projects may also be defined more broadly as solutions, to encompass operations and management improvements that are less capital-intensive than typical transportation projects.

The LRTP project lists should be divided into three segments, the TIP plus two years, the remaining Twelve Year Program (TYP), and the rest of the years through the Plan horizon. MPOs and RPOs may choose to further divide the outer years of the plan. The LRTP project list should be consistent with the current TIP and all project phases should be identified in the appropriate yearly increments if pre-construction funding is identified. For the remainder of the TYP all project phases for moderately complex and complex projects should be identified in the appropriate increment. Minor projects or non-complex betterments beyond the TIP plus two years may be listed as line items. The remaining years of the long range plan must consider what can reasonably be accomplished over the life of the plan. The intent of the breakdown structure is to fully fund projects throughout the life of the plan.

If a project is removed from the TIP MPOs/RPOs should update their LRTPs to address the movement of projects from a TIP to a region’s TYP. In addition, the region’s LRTP should remain fiscally constrained and each project or project phase identified be fully funded as amendments occur.

Reasonably expected revenues should then be allocated to the different expenditure categories based on policy and identified need. In order to better demonstrate fiscal constraint by project type, the LRTP project lists should be grouped in categories, for example; Highway, Bridge, Transit, Intelligent Transportation Systems (ITS), Traffic Signals, Rail Freight, Aviation, and Non-Motorized. These categories will vary from region to region based upon available funding and the specific needs identified in their LRTP.

An inflationary factor is provided through the PennDOT Office of Planning. This factor should be applied to current year estimates and compounded annually to determine future costs by the year of expenditure (YOE).



## Project Lists

### Project List Checklist

Include a project list and map, where appropriate, for each of the project categories listed in the plan.

Include the short-term TIP projects and the more long-term projects that will make up the plan.

Include a map number, the project name, the municipality where each project is located, the project limits, a general scope of work, a cost estimate, and the anticipated funding timeframe.

At a minimum divide the funding timeframes into the TIP (yearly segments) plus two years by project phase, the rest of the TYP by project phase if known, and the remaining years to the Plan horizon.

Each segment includes projects that could reasonably be funded during that timeframe.

Projects that are outside of fiscal constraint should be listed in the Appendix for information purposes.

Project specific planning studies that have been completed should be listed in the Appendix for information purposes.

### Long Range Transportation Plan

#### Twelve Year Program

#### TIP+2

One Year (1)	One Year (2)	One Year (3)	One Year (4)	Two Years (5-6)	Six Years (7-12)	Remaining Years to Plan Horizon (13-20+)
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# Identification of Performance Measures

## RESOURCES:

### TRB Performance Measurement Exchange



### AASHTO Performance Management References and Resources



As transportation planning and operating agencies strive to improve their efficiency and effectiveness, they have increasingly turned to performance measures to provide credible, quantitative information to support their analysis and decision-making. Measurement of transportation system condition and performance has become a more explicitly acknowledged component not only of the planning process, but also in programming, budgeting, and system operation. Measures help agencies provide accountability to the public, stay focused on intended results, improve communication with internal and external customers, and improve delivery of services.

Ideally, the plan's goals and objectives would easily translate into quantifiable performance measures to permit an objective analysis and comparison of investment alternatives. The reality is that many goals and objectives are difficult—or nearly impossible—to quantify. In the absence of quantitative analysis, many regions have employed the use of qualitative measures. Qualitative measures can be just as valid as quantitative measures (particularly for analyzing quality of life issues), if they are used in a structured and objective manner. However, it is important to be aware of the challenges inherent in qualitative measures, including the potential for subjectivity, problems in separating perception from reality, the need to carefully describe each solution so it can be fairly rated, and the difficulty in predicting the qualitative benefits of any given solution.

There are literally hundreds of potential evaluation measures, each with its own strengths and weaknesses, making it challenging to determine which measures are most appropriate for a given region. Developing performance measures will likely require significantly more effort to reach consensus than one might expect. Adequate time and resources should be devoted to this task so delays do not occur in the overall plan development process.

## Principles for Identifying Transportation Performance Measures

Directly reflect and relate to one or more transportation objectives.

Be technically sound.

Be understandable to decision-makers and the public.

Be focused on outcomes rather than outputs.

Be relevant to system users' interests.

Be possible to analyze using clear and transparent tools or frameworks.

Be applicable to multiple modes, whenever possible.

Be easily and accurately predicted or estimated using current models and data.

Be limited in number.

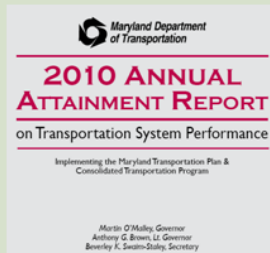
Be potentially transferable to any transportation system or plan monitoring effort.



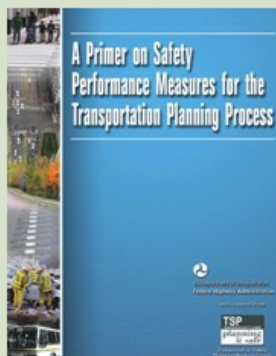
# Identification of Performance Measures

## RESOURCES:

[Maryland DOT Annual Attainment Report on Transportation System Performance](#)



[A Primer on Safety Performance Measure for the Transportation Planning Process](#)



Metropolitan Planning Organizations and Rural Planning Organizations should consider tracking performance in the following areas which are consistent with the statewide transportation plan (PA Mobility Plan): safety; transportation, land use, economic development and environmental stewardship; sustaining quality infrastructure, mobility and accessibility, and maximizing benefits.

### Sample Performance Measures

Decrease Annual Fatalities and Fatality Rate: All Vehicles (PennDOT Bureau of Highway Safety and Traffic Engineering (BHSTE))

Decrease Annual Serious Injury Crashes: All Vehicles (PennDOT BHSTE)

Increase Number of Transportation Strategies Implemented that Minimize Impacts to Natural, Historical, and Cultural Resources (MPO/RPO)

Decrease Number of Structurally Deficient Bridges (PennDOT Bureau of Design)

Percentage of Interstate/NHS Mileage by IRI Rating (PennDOT Bureau of Planning and Research)

Commute Passenger Mode Split (ACS)\*

Decrease Total Regional Annual VMT: All Vehicles Per Capita (PennDOT Bureau of Planning and Research)

Percent of Funding Designated for System Preservation (MPO/RPO)

Actual Project Cost (Includes Preliminary and Final Design and Construction) Compared to LRTP and TIP Estimates (PennDOT Districts)

Percentage of Projects Where the Actual Let Date Is On or Before the TIP Projected Let Date (PennDOT Districts)

Percentage of Projects Requiring Design Supplements After the TIP to Address Unanticipated Environmental Issues (PennDOT Districts)

Percentage of Projects Placed on the TIP That Were Not Identified in the LRTP Excluding Asset Management Projects (Accelerated Bridge Program, System Preservation, etc.) That Are Incorporated into a Line Item (MPO/RPO)

Increase Percentage of Projects on the STIP That Are Advanced (PennDOT CPDM)

\*Information is not currently available in all areas. (Cameron, Forest, Fulton, Potter, Sullivan)



# Planning Components Summary

## RESOURCES:

PennDOT Design Manual 1

PennDOT Design Manual 1A

Transportation Program Development and Delivery Process Roles and Responsibilities		
MPO/RPO Roles	PennDOT District Roles	PennDOT Central Roles
<b>Focus available funds and resources on the most appropriate transportation needs</b>		
Link local plans and goals to transportation need, including asset management	Be involved early in planning at local, county, MPO/RPO levels as collaborators	Centralize access to new information, data sources, including statewide priorities
Share expertise and information proactively with all collaborative parties	Share expertise and information proactively with all collaborative parties	Share expertise and information proactively with all collaborative parties
<b>Improve cost estimating for potential projects</b>		
Share cost estimation methodologies with municipal, county partners and work with PennDOT staff in collaborative cost estimation process	Work collaboratively with MPO/RPO staff on cost estimation and documentation at the LRTP stage and into TIP/STIP development	Provide biennial financial guidance, and measure effectiveness of estimate process involving DOT/ Planning Partner collaboration on costs
<b>Increase accuracy in project scheduling and improve predictability for project delivery</b>		
MPO/RPO Public Participation Plan should involve all interested parties in a variety of ways to clarify issues	Work with MPO/RPO staff to identify environmental issues and document to NEPA level of detail, sharing all engineering, environmental, and public issues with MPO/RPO	Share information that might affect schedules proactively with all parties
Begin environmental inventory early in process		
Proactively engage project sponsors to ensure local ownership for projects prior to implementation		



# Planning Components Summary

Transportation Program Development and Delivery Process Roles and Responsibilities		
MPO/RPO Roles	PennDOT District Roles	PennDOT Central Roles
Develop better and more accurate project scopes		
Use existing studies or develop screening activities associated with Level 2 forms preparation	Share design criteria and study issues with all partners	Share information on how NEPA documentation should be done
	Plan to do screening activities in collaboration with MPO/RPO	
Better reflect national, state, and local goals in the project prioritization and selection process		
Align initiatives of the DOT, PA Governor and Legislature, PennDOT, the statewide LRTP, county, and municipal comprehensive plans with the regional project prioritization and selection process	Assist MPO/RPO in identifying measures to prioritize and select projects which consider communities, the environment, land use, and transportation planning	Assist planners in measures to prioritize projects linking land use to transportation planning
Select projects which consider communities, the environment, land use, and transportation planning		
Commence communication, coordination, and cooperation within and between PennDOT, the MPO/RPOs, the Federal Highway Administration (FHWA), Federal Transit Administration (FTA), other transportation planning entities, tribal nations, and the resource agencies in planning		
Involve interested parties in LRTP process, facilitate PennDOT interaction with local planners	Liaison with Federal agencies, resource agencies, MPO/RPO, and other transportation planning agencies proactively and regularly	Liaison with Federal agencies and resource agencies (as needed); monitor District and Central Office involvement in meetings with partners
Promote early public participation and public involvement		
Proactive and inclusive public and agency opportunities are provided at MPO/RPO plan level	Coordination of NEPA public and agency involvement activities when appropriate	Stress public participation in State Transportation Commission hearings process



# **ACTIVITIES OF THE PROCESS**





# Collaborative Planning

## RESOURCES:

### [FHWA: Transportation Capacity Building Public Involvement Techniques](#)



### [IAP2's Public Participation Toolbox](#)

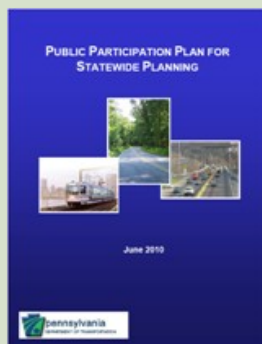
### [Public Involvement Techniques for Transportation Decision-Making](#)



### [Public Involvement Legislation, Regulations and Guidance](#)



### [PennDOT Public Participation Plan for Statewide Planning](#)



## Public Involvement Requirements

Public involvement is integral to good planning. Without meaningful public participation, there is a risk of making poor decisions, or decisions that have unintended negative consequences. With it, it is possible to make a lasting contribution to an area's quality of life. Public involvement is more than an agency requirement and more than a means of fulfilling a statutory obligation. Meaningful public participation is central to good decision making.

The fundamental objective of public involvement programs is to make certain that the concerns and issues of everyone with an interest in transportation decisions are identified and addressed in the development of policies, programs, and projects being proposed in their communities.

SAFETEA-LU requires Metropolitan Planning Organizations (MPOs) to develop and document, in consultation with interested parties, a Public Participation Plan that details strategies for incorporating visualization techniques, using electronic media, holding public meetings, and responding to public input, among other things prior to the development of the Long Range Transportation Plan (LRTP). In Pennsylvania, this requirement is extended to Rural Planning Organizations.

The public involvement process shall include the publication and distribution of draft versions of the proposed plan, providing adequate opportunity for review and comment. The approved plan must also be published or made readily available in other ways for information purposes. Where possible, this process should include visualization techniques and make use of the Internet. Finally, in non-attainment areas, there also needs to be at least one formal public meeting annually to review planning assumptions and the plan development process.

Federal regulations require that public officials (elected and appointed) and citizens have adequate opportunity to participate in the development of the LRTP before it is approved and adopted. The regulations explicitly identify several parties who should be engaged and involved throughout the plan development/update process.



# Collaborative Planning

## RESOURCES:

[SPC: 2035 Transportation and Development Plan for Southwestern Pennsylvania Public Participation](#)

Interested Parties
Citizens
Affected public agencies
Representatives of transportation agencies
Freight shippers
Providers of freight transportation services
Private providers of transportation
Representatives of users of public transit
Tribal organizations
Bicycle interests
Pedestrian interests
Organizations representing the disabled
State and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation
Other interested parties

The MPO/RPO is responsible for actively involving all interested parties in an open, cooperative, and collaborative process that provides meaningful opportunities to influence transportation decisions. Transportation has a profound influence on the lives of people. Decision makers must consider fully the social, economic, and environmental consequences of their actions, and assure the public that transportation programs support adopted land use plans and community values.

Elements in Planning for an Effective Public Participation Process
A clearly defined purpose and objectives for initiating a public dialogue on transportation issues.
Specific identification of the affected public and other stakeholder groups with respect to the plans and programs under development.
Identification of techniques for engaging the public in the process.
Notification procedures that effectively target affected groups.
Methods and measures for evaluating the effectiveness of the public involvement program.
Education and assistance techniques, which result in an accurate and full public understanding of transportation issues.
Follow-through by the MPO demonstrating that decision makers seriously considered public input.
Solicitation of feedback from the public and stakeholders on the effectiveness of the public involvement process.



## **Stakeholder, Local Official & Citizen Involvement**

Engaging the public, local officials and stakeholders in the development of the plan will result in a better long range planning process and outcome. However, engaging the public in something as potentially abstract as regional long range transportation planning is challenging. At the outset of the plan development or update process, planning partners should review their public involvement plan to make certain that it is still appropriate for the scope and scale of their plan. Public and stakeholder involvement should be incorporated throughout the process to develop goals, policies, and solutions that address the issues and concerns that are most relevant to the public, not simply those identified by transportation agencies.

One common means of improving stakeholder participation and involvement is to establish a long range plan steering committee to guide the process. Any steering committee formed should include representatives of PennDOT and USDOT staff. Other participants might include political leaders, representatives of the general public, modal interests, freight shippers, advocacy groups, environmental organizations, and/or business associations.

In addition to a steering committee, planning partners might encourage the participation of a larger group of stakeholders by establishing an advisory committee that can be periodically asked to review materials or participate in strategic discussions. This approach not only creates additional interest in the plan, but also broadens the number of constituents and stakeholders who support and champion the plan. While stakeholder involvement must be balanced, manageable, and practical, opportunities to actively engage a wide variety of stakeholders should be pursued. Consider reaching out beyond the existing membership of the MPO or RPO in the creation of the Steering Committee

To better disseminate information and to keep everyone in the public involvement process informed, planning partners should consider developing a communications strategy that outlines communication with plan participants—and goes beyond simply hosting public meetings. Some of the more common means include project brochures, newsletters, web sites, social networking, and press releases. Much work has been performed on this front and many of the resources on this page can suggest innovative approaches to engaging stakeholders and the public.



# Collaborative Planning

## RESOURCES:

### Title VI



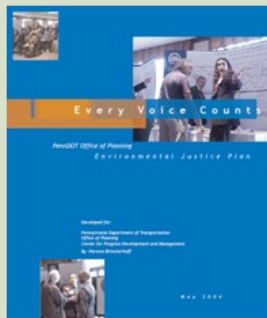
### Environmental Justice Requirements



### Americans with Disabilities Act of 1990



### Every Voice Counts



The stakeholder and public involvement process should be ongoing throughout plan development, but may vary in frequency and intensity depending on the activities being undertaken at any given time. Some activities, such as the development of goals and objectives, lend themselves to significant stakeholder involvement. Others, such as information gathering and technical analysis, do not. It is important to realize that simply making a draft plan available for public review at the end of the process does not constitute an effective public involvement strategy, because it does not provide an opportunity for substantive public input to help shape the plan. Planning partners should take advantage of the resources provided, as well as the experience of peer planning agencies, as they develop a public and stakeholder involvement program.

### Issues to be Considered

Determining the scope and scale of the public involvement process and ensuring that it meets the needs of the general public and stakeholders within the region.

Developing the schedule for public involvement incorporating public input throughout the entire development of the plan.

Identifying specific stakeholders and groups to be included in the process.

Ensuring that Title VI and Environmental Justice issues are substantively incorporated into the process.

Developing creative ways to keep the public engaged and involved throughout development of the plan.

Obtaining input from a broad cross section of the public, not just special interest groups and professional activists.

Managing expectations for public input and the impact that this input will have on development of the plan.

Resolving tensions among constituencies with differing experiences and viewpoints, such as cities versus suburbs, urban versus rural, growth versus environmental preservation, local versus regional interests, and differing fiscal priorities.

Documenting the public involvement process used in developing the region's plan and identifying what efforts were successful and what activities were not. Also recommend any changes to be considered for the next plan update.

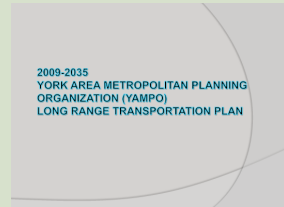
Was the LRTP presented at an Agency Coordination Meeting (ACM)?



# Collaborative Planning

## RESOURCES:

### York MPO ACM Presentation



### North Central, SEDA-COG, Centre, District 2-0-State Transportation Commission Presentation



## Agency Coordination Meeting

SAFETEA-LU requires that regions include a discussion of potential environmental mitigation activities along with potential sites to carry out the activities to be included. The discussion is to be developed in consultation with Federal, State, tribal, wildlife, land management, and regulatory agencies. In Pennsylvania, the presentation of the LRTP at an Agency Coordination Meeting satisfies this consultation requirement. The ACM consists of members of representing Federal Agencies including the Federal Highway Administration, Army Corps of Engineers, Environmental Protection Agency, and U.S. Fish and Wildlife Service; State Agencies including the Departments of Agriculture, Community and Economic Development, Environmental Protection, Conservation and Natural Resources, and Transportation, as well as; various State Commissions including Fish and Boat, Game, Historical and Museum, and the Turnpike. For identification of opportunities to present to the ACM please contact the PennDOT Center for Program Development and Management or the Bureau of Design Environmental Quality Assurance Division.

One of the benefits of this process is to involve the agencies in the planning process to try to avoid impacts. Strong visualization technique can be employed such as utilizing GIS to overlay the existing resources with the location of the projects as identified on the LRTP.

## Opportunities to Consider for ACM Presentation

1. Overview of the region's transportation system and land use.
2. Overview of the region's environmental, societal, and cultural resources.
3. Discussion of the public involvement process.
4. Overview of the Plan's vision, goals, and objectives.
5. Discussion of the consideration or inclusion of Federal, State, tribal, and Local policies and Plans.
6. Project prioritization and selection process by mode (include safety).
7. Overview of the project list.
8. Discussion of avoidance of resources and mitigation opportunities.

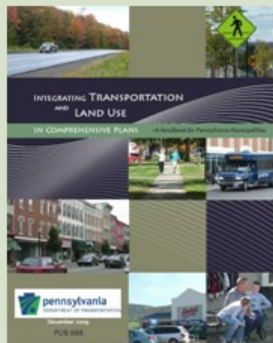




# Coordinated Planning

## RESOURCES:

### Integrating Transportation and Land Use in Comprehensive Plans



### PA Municipalities Planning Code



### PA Mobility Plan



Pennsylvania's planning throughout geographical levels and across disciplines creates an opportunity to coordinate efforts and to improve transportation for the state. The purpose of the analysis is to provide planning partners, the public, stakeholders, and other decision-makers with critical information to better assist in the development and direction of the plan. This information provides a context for the development of the plan and provides participants with a better understanding of relevant statistics, issues, and trends. It is important to look at the direction of other plans—both short and long term—that could directly or indirectly impact a region's transportation system. This is an opportunity to factor in the results of corridor studies as well as other transportation plans and studies at the local, state, and even national levels. With a recent emphasis on ensuring consistency and linkages with other ongoing planning activities, it is also important to consider county land use plans, long range plans of transit properties, economic development plans, utility expansion plans, etc.

## County and Multijurisdictional Comprehensive Plans

The Municipalities Planning Code (MPC) requires that municipal and county comprehensive plans have a long range transportation component. The MPC also requires these plans to have a level of consistency between them through multiple reviews and comment periods for each plan among associated planning partners. For single county planning partners, the county comprehensive plan and the long range transportation plan may even be the same document. Larger regions should be sure their individual county comprehensive plans are incorporated into the MPO's or RPO's long range transportation plan and that the long range plan informs the comprehensive plan. The "*Integrating Transportation and Land Use in Comprehensive Plans*" Guidebook aim is to provide enhanced guidance for preparing the transportation elements of municipal and county comprehensive plans and to maximize the linkages between comprehensive plans and the decision-making processes outlined in the long range transportation plans (LRTPs) completed by the state's metropolitan and rural planning organizations (MPOs and RPOs).

## Statewide Plan

PennDOT provides further overarching guidance to its planning partners through its statewide long range transportation plan, the Pennsylvania Mobility Plan. The initiatives within this plan outline how MPOs and RPOs can work toward the vision for the entire state by establishing consistent objectives and goals in their regional long range transportation plans.



# Coordinated Planning

## RESOURCES:

[Metro Washington Council of Governments: Vision and the Federal Planning Factors](#)



## Federal Factors

Federal regulations require that the following eight factors be explicitly considered, analyzed as appropriate, and reflected in planning products.

<b>Eight Federal Factors</b>
Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.
Increase the safety of the transportation system for motorized and non-motorized users.
Increase security for transportation system users.
Increase the accessibility and mobility options available to people and for freight.
Protect and enhance the environment, promote energy conservation, improve quality of life, and promote consistency between transportation improvements and state and local planned growth and economic development patterns.
Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.
Promote efficient system management and operation.
Emphasize preservation of the existing transportation system.

Although plans must consider each of these factors, the broad nature of each factor offers great flexibility in determining how these mandates align with regional planning efforts.

## Strategic Highway Safety Plan

The Strategic Highway Safety Plan (SHSP) has been developed in order to target priority Safety Focus Areas (SFAs) and strategies/actions to reduce highway fatalities on Pennsylvania's roadways. This plan details how, by 2011, Pennsylvania will reach the goal of reducing annual fatalities to 1,150 or less using a comprehensive approach to highway safety improvement that employs our best thinking, resources, and partners.

Safety stakeholders and partners from both the public and private sector (including representatives from PennDOT Engineering Districts and Planning Organizations), representing the 4 E's of highway safety (Engineering/Enforcement/Education/ Emergency Services), contributed to the development of this plan.





# Coordinated Planning

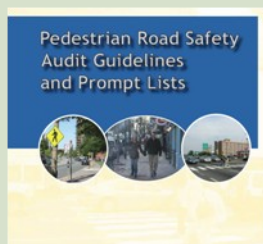
## RESOURCES:

[PA Highway Safety 5% Report Methodology](#)

[FHWA Roadway Safety Audit Guidelines](#)



[Pedestrian Roadway Safety Audit Guidelines and Prompt Lists](#)



SAFETEA-LU Section 148 created a new Highway Safety Improvement Program (HSIP) as a “core” FHWA program with separate funding. The purpose of the HSIP is to reduce traffic fatalities and serious injuries on public roads. The HSIP provides funds for safety improvement projects and rail-grade crossing improvement projects in Pennsylvania. As part of the new HSIP, States are required to submit an annual report describing not less than 5 percent of their highway locations exhibiting the most severe safety needs. In order to comply with regulation, PennDOT used a data driven approach to identify the top 25 locations for each MPO/RPO that exhibit the most severe safety needs and could potentially be addressed with these funds. This list of locations has been distributed to the respective Planning Organization and Engineering District’s for their use. This will be updated by PennDOT every even year and will be passed on to the Planning Organizations and Engineering District’s once completed.

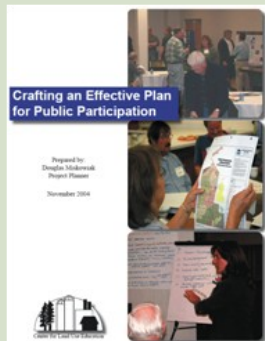
Roadway Safety Audits (RSA) can also be conducted during the development of the LRTP to identify needed safety improvement. RSA can be used as proactive approach to improving transportation safety on future or existing roadways and is adaptable to local needs and conditions. RSA are usually done at a particular location or stretch of roadway, where there is a perceived or documented safety problem. A team of experts are assembled who are preferably unfamiliar with the area and the issues, to increase the likelihood of an objective analysis. Data is examined, the site is field reviewed, observations and recommendations are made from strictly a safety viewpoint to the plan stakeholders.



# Coordinated Planning

## RESOURCES:

### Crafting an Effective Plan for Public Participation



### **Public Participation Plan**

SAFETEA-LU requires that, "the MPO shall develop and use a documented participation plan that defines a process for providing citizens, affected public agencies, representatives of public transportation employees, freight shippers, providers of freight transportation services, private providers of transportation, representatives of users of public transportation, representatives of users of pedestrian walkways and bicycle transportation facilities, representatives of the disabled, and other interested parties with reasonable opportunities to be involved in the metropolitan transportation planning process." In Pennsylvania, this requirement is extended to the RPO.

The purpose of the MPOs/RPOs participation plan is to establish the process by which the public can participate in the development of regional transportation plans and programs. The public participation plan should be designed to assist MPO/RPO staff in implementing an effective public participation process through a variety of strategies. It provides MPO/RPO staff with a menu of techniques or activities from which they can tailor their specific program's input process. Which public participation methods the MPO/RPO uses will require a careful analysis of what is wished to be accomplished as well as the scope of the particular transportation project. Plenty of flexibility is available to MPOs/RPOs in developing specific public involvement programs. Every given situation or region in Pennsylvania is different, and each approach to a specific public involvement challenge will be unique. When significant written and oral comments are received on the draft LRTP and as a result of the participation process or the interagency consultation process required under the transportation conformity regulations, a summary, analysis and report of the proposed comments shall be made as part of the final LRTP.

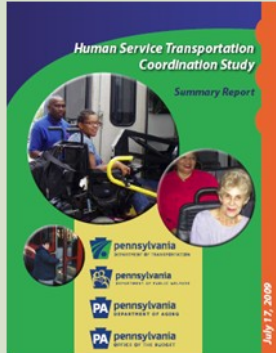
It is important to note the public participation plan should be prepared prior to the development of the LRTP. The public participation plan should have public input during its preparation and have a 45-day comment period before the MPO/RPO board adopts it.



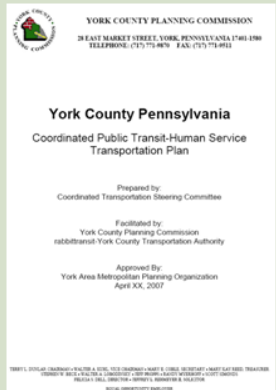
# Coordinated Planning

## RESOURCES:

### PA Human Services Transportation Co-ordinated Study



### York Coordinated Public Transit-Human Service Transportation Plan



### SPC Congestion Management Process



## Coordinated Public Transit/Human Services Transportation Plans

The aim of the Coordinated Public Transit/Human Services Transportation Plan is to improve transportation services for persons with disabilities, older adults and individuals with lower incomes by ensuring that communities coordinate the available transit resources. Coordination enhances transportation access, minimizes duplication of services and facilitates the most appropriate cost-effective transportation possible with available resources. Federal transit law requires that projects selected for funding under the following Federal Transit Administration (FTA) programs be derived from a coordinated plan including the Elderly Individuals and Individuals with Disabilities Program, Job Access and Reverse Commute Program, and the New Freedom Program.

MPOs and RPOs are not required to be the lead agency in the development of the coordinated plan but; Federal guidance states that the coordinated plan may be developed separately or as a part of the metropolitan transportation planning process. In any case, MPOs and RPOs should make certain that the plan is coordinated and consistent with their regions transportation planning process.

## Congestion Management Process

Federal transportation legislation (SAFETEA-LU) requires that each metropolitan planning area in the United States with a population greater than 200,000 have what is called a Congestion Management Process (CMP). The CMP is a regional program that addresses and manages congestion within a region in order to facilitate the movement of people and goods.

The CMP is a broad, regional level planning tool designed to help manage congestion by identifying congested corridors and recommending multi-modal strategies for congestion mitigation. The goal of a CMP is to provide information that helps transportation planners, professionals and others to understand the overall congestion climate in individual corridors and the region. Data on the congestion climate helps MPOs, in partnership with other agencies, to formulate congestion management strategies. Data and information from the CMP benefits the transportation planning process by helping the region to focus limited federal transportation dollars where they can have their greatest impact.



# Coordinated Planning

## RESOURCES:

### Planning for Operations Regional ITS Architecture



### Regional Operation Plans

#### **Pennsylvania DOT Regional Operations Plans (ROP)**

The Pennsylvania Department of Transportation (PennDOT) is responsible for operations planning of the state's highway system. The statewide plan is called out in the recently adopted Transportation System Operations Plan (TSOP), which defines PennDOT's operational direction for the next several years.

There are nine operations regions across the Commonwealth. Each region is being asked to develop, adopt, and execute its own operations plan with support from central office. The Regional Operations Plan (ROP) will prepare the way for operational identity and interaction by the PennDOT District offices and planning partners in the region. In developing the ROP, each region will use TSOP as a starting point, but address its unique—statewide direction to their own specific, real-world regional needs. The ROP, already developed, should reflect the conditions, vision, and transportation priorities of the region.

The ROP will lay out the strategic transportation operations program for the region, including description of regional projects. It will identify, define, and coordinate statewide-based projects, both short-term (one year or less) and long-term (two or more years). The ROP will be used to coordinate with regional and statewide operations, planning, and implementation. The ROP will be used to coordinate with regional and statewide operations, planning, and implementation. The ROP will be used to coordinate with regional and statewide operations, planning, and implementation. The ROP will be used to coordinate with regional and statewide operations, planning, and implementation.

Click a region on the map.



South-Central  
North-Central  
Northeast  
Southeast  
South  
Central  
North  
West  
East

## **Intelligent Transportation System Architecture Plan**

Intelligent transportation systems (ITS) encompass a broad range of wireless and wire line communications-based information and electronics technologies. When integrated into the transportation system's infrastructure, and in vehicles themselves, these technologies relieve congestion and improve safety. ITS is one way to increase the efficiency, safety and security of a transportation system. ITS involves the use of advanced computer, electronic and communications technologies and emphasizes enhancing travel on existing infrastructure (highways, streets, bridges, trains). Some examples of ITS technologies include advanced traffic signals, roadway and weather monitoring stations, bus and maintenance vehicle location systems, electronic roadside information signs and automated vehicle control systems.

The National ITS Program was established by ISTEA in 1991. Further federal regulations focused on extending ITS to regional planning efforts and training transportation professionals to deal with the range of issues associated with the adoption of advanced transportation technology. The development of the regional ITS architecture is not meant to compete with the formal transportation planning process. In fact, key ITS projects and initiatives are targeted early in the planning process. When updating LRTPs, MPOs/RPOs should be sure to comply with current federal regulations.

Intelligent transportation system architecture and standards, calls for the development of the regional ITS architecture to be consistent with the transportation planning process. It is important to coordinate the general LRTP planning efforts with plans for specific projects that entail the use of ITS technology. These plans should be developed in an open forum and they should be consistent. The resultant plans would reflect consideration of both documents during the planning process.

## **Regional Operations Plan**

Regional Operation Plans (ROP) are designed to outline transportation operations projects, programs and policies to be implemented in a region. Operations improves safety and security for transportation system users and helps to improve accessibility and mobility through better management of incidents and events that affect the transportation system. The ROP development process explores the needs of the operations area and identifies priority deployments, programs and policies that best meet those needs, both for highways and public transportation.



# Coordinated Planning

## RESOURCES:

[The Role of the Metropolitan Planning Organization \(MPO\) In Preparing for Security Incidents and Transportation System Response](#)

[Summary Report: MPO Peer Workshop on Addressing Security Planning and Natural & Manmade Disasters](#)



## Transportation Security Evacuation Plan

In accordance with the heightened attention to the security of travelers on our Nation's transportation system, emergency relief/disaster preparedness plans and strategies and policies that support homeland security (as appropriate) and safeguard the personal security of all motorized and non-motorized users has been identified as a distinct factor to be considered in the transportation planning processes.

Previously, security had been coupled with safety. De-coupling the two concepts in SAFETEA-LU signified a heightened importance of both safety and security to transportation decision-making. This guidance aims to promote greater attention, coordination, and planning for security among MPO/RPO planners.

USDOT included language within the planning regulations to clarify that there are differences across regions and disasters to encourage development of an approach that fits locally specific needs. Consideration of the planning factors shall be reflected, as appropriate, in the transportation planning process. The degree of consideration and analysis of the planning factors should be based on the scale and complexity of the many issues associated with readiness. Minimally, a transportation security evacuation plan must be identified for the region in the plan documentation.



# Coordinated Planning

## RESOURCES:

### Greenway Planning Toolbox



## County Greenway and Open Space Planning

The Department of Conservation and Natural Resources (DCNR) established the County Greenways and Open Space Network Planning Program to assist counties in planning for greenway corridors. Working in cooperation with municipalities, counties are developing visions for their greenway networks and integrating those visions into county land use documents. Greenways are an important strategy for achieving land use management, recreation, open space protection, and community revitalization goals.

County Greenway and Open Space Plans contribute to Pennsylvania's statewide greenway network by:

- Identifying the county's overall greenways network and setting a framework for municipal greenways planning.
- Establishing an inventory of natural resources and open space to be protected, a critical component of the greenways network.
- Setting priorities for implementing the county's identified greenways network.

Coordinated Planning Checklist	Considered
County and Multijurisdictional Comprehensive Plans	
Statewide Plan	
Federal Factors	
Comprehensive Strategic Highway Safety Improvement Plan	
Public Participation Plan	
Coordinated Public Transit/Human Services Transportation Plans	
Congestion Management Process	
Intelligent Transportation System Architecture Plan	
Regional Operations Plan	
Transportation Security Evacuation Plan	
County Greenway and Open Space Plan	





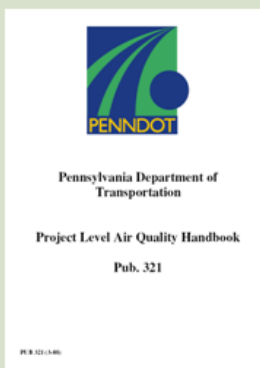
# Air Quality Conformity

## RESOURCES:

### Project Review and Classification Guidelines for Regional Air Quality Conformity



### Project Level Air Quality Handbook



### DVRPC Air Quality Partnership



“Nonattainment” areas are geographic areas that do not meet the federal air quality standards, and maintenance areas are areas that formerly violated but currently meet the federal air quality standards. If no violations of air quality standards have been found, the area is considered to be in compliance or attainment with federal air quality standards.

An area can be designated “nonattainment” for one pollutant and in attainment for another. Transportation conformity is required for all ozone, carbon monoxide, nitrogen dioxide, and particulate matter in nonattainment or maintenance areas.

The Clean Air Act (CAA) of 1990 identifies the actions states and MPOs/RPOs must take to reduce emissions from on-road mobile sources in nonattainment or maintenance areas. In addition, regionally significant projects identified in the LRTP should be in sufficient detail to develop cost estimates including a design concept and design scope descriptions of all existing and proposed transportation facilities regardless of the funding source in nonattainment and maintenance areas for conformity determinations under the EPA's transportation conformity rule.

The challenge for MPOs/RPOs in nonattainment or maintenance areas is to decide on a mix of transit and highway investments that, combined with measures such as Inspection and Maintenance (I\M) programs or reformulated gasoline, will keep emissions within the allowable limits for motor vehicles.

MPOs/RPOs are encouraged to participate in air quality planning and to identify transportation strategies that will help reduce emissions from on-road mobile sources of pollution.

#### **According to the CAA, transportation plans, TIPs and projects cannot:**

- Create new violations of the National Ambient Air Quality Standards (NAAQS);
- Increase the frequency or severity of existing violations of the standards; or
- Delay attainment of the standards.

Though not required, many MPOs/RPOs have developed public education and communications campaigns about the connection between transportation and air quality; these encourage the public to make travel choices that will benefit air quality.





# Air Quality Conformity

## RESOURCES:

### Clean Air Act



### EPA Conformity Regulations



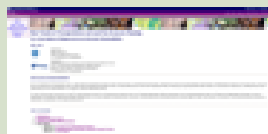
In non-attainment and maintenance areas for transportation-related pollutants, FHWA and FTA, as well as the MPO or RPO, must make a conformity determination on any new or revised plan in accordance with the Clean Air Act (CAA) and Environmental Protection Agency (EPA) conformity regulations. The intent of the conformity process is to make certain that regions do not undertake projects that are inconsistent with state obligations to meet National Ambient Air Quality Standards (NAAQS). To determine conformity, MPOs are required to forecast emissions of criterion pollutants and compare these forecasted levels to permissible levels as outlined in the State Implementation Plan. Conformity regulations require that planning partners collaborate with FHWA, FTA, and EPA to evaluate whether proposed plans would result in increased pollution levels and/or non-conformance. Regions where plans do not meet conformity requirements risk the loss or disruption of federal transportation funding.



# Scenario Analysis

## RESOURCES:

[New Trends in Transportation and Land Use Scenario Planning](#)



Scenario planning provides a framework for developing a shared vision for the future by analyzing various forces (i.e., health, transportation, economics, environmental, land use, etc) that affect growth. Scenario planning can be done at the statewide level or for metropolitan, or rural areas. Scenario planning tests various future alternatives that meet state, county and community needs. Effective scenario planning will actively involve the public and elected officials on a broad scale, educating them about growth trend and trade offs, and incorporating their values into future plans.

One challenge of long range planning is that none of us can know how the world (or our region) may change over the next 25 years. To improve the likelihood that planning translates into better decision-making, it can be useful to project what impacts alternative futures may hold for a region and its transportation system.

These alternative futures, or “context scenarios,” can assist in identifying future transportation problems and opportunities under various “what ifs.” Any context scenarios should be developed with current trends and issues in mind. Scenarios may also flow logically from the development of a plan’s vision, goals, and objectives, as stakeholders and the general public begin to think creatively about the future of the region.

The rationale for the development of alternative futures may be rooted in external factors (changing economy, market-driven growth patterns, etc.) or could be crafted to reflect conscious policy choices (incentives for infill development, etc.). Some context scenarios used elsewhere have included considering the effects of differing levels of population and employment growth, continued or accelerated dispersion of growth, re-densification (infill development), and changes in the regional economy. While it is unlikely that any of these will represent the actual future, they can provide useful information to assist in decision-making. They should be viewed as an opportunity to educate planners, the public, and stakeholders about what different futures may hold and to demonstrate the sensitivity of the transportation system to external factors.



# Scenario Analysis

This type of analysis can be used for several purposes. It can:

- Serve to educate the public about the effects of alternative futures on system characteristics such as mobility, accessibility, safety, land use and consumption, air quality, etc.
- Identify locations or corridors that are or will be overtaxed with traffic and those that may have excess capacity and are better suited to accommodate growth.
- Identify whether continued (or restricted) development in certain areas might lead to (or avoid the need for) expensive capacity expansion projects.
- Identify areas or corridors that would experience problems under any scenario and require attention.
- Determine whether changes in growth and travel patterns would produce significant impacts.
- Be used in identifying proposed solutions.

Prior to analysis, planning partners should make every effort to gain reasonable buy-in regarding assumptions. Third-party data may be the most appropriate source for items such as population and employment projections, because they are based on an objective source. Third-party projections are often prepared at the county level, so some assumptions may still need to be made regarding where within the study area projected population and employment changes may occur. The development of these assumptions can, at times, become contentious. Because growth projections can greatly affect a long range plan, it is critically important that the allocation of growth and land uses be done in as impartial and realistic a manner as possible.

Finally, scenarios will likely produce location-specific impacts, so partners should be aware that policy-driven scenarios that “work” in one region should not be assumed to be applicable elsewhere.

## Issues to Consider for Scenario Analysis

Deciding which issues are important enough to warrant testing through the use of scenarios.

Deciding how many scenarios are appropriate to analyze, given available resources and the range of potential scenarios that are of interest to the region.

Defining the “baseline scenario”.

Determining the appropriate level of detail for defining each scenario, again given available resources. This may depend on whether the scenario is to be used in a qualitative or quantitative analysis.

Determining which trends and projections to use and how to resolve or reconcile differences.

Determining resources, handbooks, and tools (including software) to support scenario planning efforts.



# Scenario Analysis

This activity requires the development of a baseline scenario and several alternative scenarios. The baseline should represent what is truly expected to occur over the planning horizon. While never perfect, planners will ultimately need to develop a baseline using current best information and professional judgment.

The most critical set of variables that affects a transportation system over the long term tends to be population and employment, and the demographics and future location of both variables. The estimation of these is often a source of contention and debate.

When developing context scenarios, it is most useful to change only one of the inputs, in order to present a clear picture of the impacts of the scenario. While these scenarios will represent an oversimplification of what is likely to occur, the purpose is simply to explore what might happen if one of these assumptions is significantly changed. Partners should not be overly concerned about trying to represent every possible option for the future.

NOTE: Because the impacts of scenarios can typically best be measured with the assistance of a travel demand model, this activity will likely be most valuable in regions that have such capabilities.

## **Analytic Framework & Tools**

The purpose of this activity is to define and develop the tools to analyze both the overall transportation system as well as specific solutions. For many planning organizations, this involves the use of a network-based travel demand model. For other planning organizations (particularly those with more limited resources), this may involve simply developing a structured evaluation methodology based on a combination of qualitative assessment and relatively simple quantitative analysis tools.

In most cases, evaluation criteria and analytical tools are developed in tandem to arrive at a set of evaluation measures that accurately reflect goals and objectives and can be effectively analyzed. However, evaluation criteria should not be selected only according to ease of analysis.

Due to the considerable time and investment needed to develop sound analytical tools, MPOs/RPOs should be realistic in determining how much they can and should take on within the plan development process. Experience has shown that expectations about level of effort and development timeframes are often too optimistic. While MPOs/RPOs should challenge themselves, they should recognize that delays in tool delivery can lead to delays in plan development. Advance consideration should also be given to how the outputs from an analytical tool will be used, rather than developing the tool and later realizing that its output is not particularly valuable in the subsequent analyses. Planning partners may wish to develop a long-term plan for the development and incorporation of additional analytical tools. This will help make certain that the analytical capabilities of the planning partner are being advanced both during and outside of plan development.



## Scenario Analysis

Once an analytical framework has been developed and refined, the approach should be documented and circulated for review to make certain that it is technically sound. It is usually desirable to document it in a technical report or appendix for future reference and to increase the transparency of the process. Steps for improving the capabilities of the analytical framework should also be identified and prioritized. These recommendations can be acted upon in the years between updates to improve ongoing use of the analytical framework and upgrade it for the next plan update.

### **Issue to Consider When Adopting An Analytical Framework or Tools**

Balancing qualitative and quantitative analysis. Quantitative tools are often presumed to be more reliable, but they don't always provide answers to all questions. It is important that qualitative analyses be conducted in a structured and reproducible manner and that the results are sound and understandable.

Determining the level of resources that can be dedicated to modeling—both for the plan and on an ongoing basis. In some cases, it may be possible (and preferable) to share and build upon work completed by other regions.

Identifying and collecting reasonably accurate and reliable data.

Developing a means to properly evaluate the performance of non-traditional solutions, such as operational improvements.

Developing an analytical framework that allows for meaningful comparisons among potentially different sets of evaluation criteria.

## **Plan Implementation & Monitoring**

Long range plans should include elements related to both implementation and monitoring. For this document, we are treating these related topics as one, although for each element there are really two steps. The first, which should be completed as part of the plan, is for planning partners to develop specific strategies for how they will execute implementation and monitoring. The second step is the actual process of implementing and monitoring the plan. While this second step occurs outside the plan development process, it is this “follow through” that will ultimately determine the lasting value and impact of the plan, and which will feed into the development of the next plan update.

The plan’s implementation section should outline how to translate the plan’s policies, programs, and projects into reality, particularly through the Twelve-Year Program and the Transportation Improvement Program. While it is usually clear how the required list of projects will be translated into programming documents, integrating the more theoretical policies and programs can be more challenging. The most common approach entails identifying actions related to plan development, the parties responsible for their completion, significant implementation issues, and timelines for milestone completion. However, planning partners must carefully consider the contents of their plan, as well as the local context, and develop an implementation plan that is tailored to their specific needs.

In addition, the implementation section should address the manner in which the more theoretical concepts in the plan will translate into the day-to-day activities of regional planning agencies, as well as their local, regional, and state partners. Finally, the implementation section should also address how the plan’s vision, goals, and objectives will be used on an ongoing basis for interim decision-making related to regional transportation policies and investments. Without developing an explicit connection between the plan and ongoing process and programming responsibilities, planning partners will not realize the full benefits of the efforts that they invested in developing their long range transportation plan.

The plan should also include a section devoted to monitoring, which should outline a framework or process through which the planning partner intends to track the implementation of the plan. This section should describe the specific items that are to be monitored, how they will be monitored, and the frequency with which they will be monitored. Planning partners should also think carefully about how the items that are monitored will be recorded, categorized, analyzed, and presented, to make certain that the monitoring process has value while being manageable and realistic to implement.



# Continuous Planning

In an era of increasing demands for accountability on the part of public agencies, many have demanded that plans be “measurable.” However, this term is used rather loosely and can mean a wide array of things: outcomes of the plan, completion of activities, system performance, etc. Most often, the term is taken to mean that a plan should be measurable using a set of defined performance criteria. However, there are several challenges that accompany this approach.

- First, this can imply a monitoring effort for a long range plan. Most of the actions outlined in such a plan will take years to implement and may be impossible to monitor prior to the next plan update.
- Second, there are many external factors that can greatly affect the more common transportation performance measures such as VMT, congestion, and accidents. Planning partners can often influence these, but they are not necessarily within the control of PennDOT or its planning partners.
- Third, data related to many of the more valuable measures are difficult and/or expensive to collect, and second-best measures and proxies are often not as technically sound.
- Finally, certain objectives commonly included in plans, such as creating long term economic development, simply don’t lend themselves to performance measurement.

A long range plan is intended to take a long term perspective and will include many actions, strategies, and policies that may take years or decades to be fully implemented. Attempting to measure the effectiveness of a long range plan through the use of short term indicators is neither fair nor appropriate. However, this does not mean that performance measurement is not valuable. This process is often extremely useful for better informing decisions, but needs to be given an appropriate weight given that the focus on near term results may not be appropriate for a long term plan.

A second approach is to focus monitoring on ensuring that actions outlined in the plan are implemented. The most obvious shortcoming of this approach is that it focuses on outputs (simply completing actions) as opposed to outcomes (effectiveness of actions). However, given the challenges of using performance measures as mentioned above, this approach might be entirely appropriate, particularly considering the data and resource limitations that affect most partners. While not guaranteeing that all actions undertaken as part of the plan are being measured for effectiveness, at a minimum this approach makes certain that a partner is simply following through with their stated program of plan implementation activities. Partners that employ this approach should also think carefully about the implementation actions that they define in the plan and closely relate these activities to their goals and objectives.





## Continuous Planning

MPOs/RPOs may wish to consider yet another approach to implementation monitoring. This would entail “monitoring” in two parts. The first component would be to simply monitor the completion of actions identified in the plan. This is relatively easy to do and reflects follow through on the plan. The second would be to develop an additional monitoring effort that uses performance measures focused primarily on the performance and condition of the transportation system or other transportation related factors such as land use, air quality, economic impact, etc. The intent of this second component would not be to assign responsibility, but instead to simply provide better information for decision makers and stakeholders. Such information would be valuable in the background analysis portion of subsequent plan development. To prevent the performance measures from becoming a yardstick by which the success of the plan is measured, it might also be best to separate such an effort from the long range plan. Over a long period of time and given a stable set of performance measures, it might also eventually be possible to relate the content of the plan to the performance of the transportation system, although careful interpretation of any such analysis would be required.

Issues to Consider
Involving external parties to lead or champion actions and initiatives contained in the plan.
Linking long range planning with day-to-day planning partner activities, policy decisions, and the programming process.
Determining an appropriate level of monitoring effort for the plan, recognizing that it may require significant resources.
Ensuring that the monitoring program is meaningfully tracking the implementation of the plan.
Incorporating the results and lessons learned from the implementation and monitoring process into the next plan update.



# Continuous Planning

## Creating a Living Plan

The long range transportation planning process will result in a document that includes a needs assessment, financial plan, list of projects, the air quality conformity analysis, and a variety of other analyses and reports specific to the region. The facts and analysis will remain unchanged, but the plan itself must be a “living plan,” with ongoing relevance and usefulness to the region.

There are three main elements that go into making a long range transportation plan a living plan:

- **Ongoing Updates:** Although planning organizations are required to make regular updates to the plan, there may be issues that arise over time (such as changes in the economy or major developments) that may occur between the cyclical updates. While these should not necessarily require a full update of the plan, it may be useful to make minor updates to the plan, or undertake supplementary planning exercises that use the plan as a starting point and for overall context. These efforts may also include supplemental corridor and area studies that look in greater depth at problems identified during the plan, and which will be used to inform subsequent updates.
- **Use in Ongoing Transportation Planning:** In Pennsylvania, planning organizations are required to produce Transportation Improvement Programs with a four-year planning horizon and also to collaborate with PennDOT to develop the Commonwealth Twelve-Year Program. The long range transportation plan should serve as a vital input into these shorter-range planning efforts to coordinate between the different types of planning. This coordination should take into account both the projects in the pipeline that are being planned/programmed and the more general issues, such as goals and objectives and evaluation criteria. Over time, this ongoing coordination between the various planning processes will provide the framework to develop and implement projects that achieve the region’s larger goals and objectives.



## Continuous Planning

- **Inclusion in Other Planning Efforts:** In addition to taking the plan into consideration as part of the overall transportation planning process, the plan should also serve as an input to (and take inputs from) the statewide long range transportation plan and other planning activities that are ongoing in the region. This could encompass a wide range of issues, such as open space planning, general community planning, affordable housing planning, solid waste planning, greenways planning, and other planning activities that are critical to the region's ongoing development. This exchange of information among the various planning activities within the region will make certain that the various plans are coordinated, and help to maximize the value of each individual planning effort by creating an understanding how that effort fits within the larger regional planning context.

The creation of a living plan requires an ongoing effort to coordinate with other planning activities and keep the plan's concept up to date. This reinforces the idea that regional long range transportation planning is a continuous process that is punctuated by the development and publication of a plan, as opposed to a project based activity that is oriented around the production of the long range transportation plan. By viewing the plan development process as an ongoing planning effort that involves coordination with the entire range of regional planning activities, planning partners can maximize the utility of their efforts and develop a cohesive and comprehensive transportation system.



# APPENDICES



## Appendix A

# PA Intermodal Connector Assessment Tool

Intermodal Connector Evaluation Criteria	Source	Intermodal Connector Data Collection
Average Annual Daily Traffic (AADT)	PennDOT, HPMS	
Average Annual Daily Traffic Trucks (AADTT)	PennDOT, HPMS	
Bridge Sufficiency Rating	PennDOT, BMS	
Bridge Underpass Clearance	PennDOT, BMS	
Bridge Weight Limit	PennDOT, BMS	
Directional Factor (%)	PennDOT, HPMS	
K-Factor (%)	PennDOT, HPMS	
Lane Width	PennDOT, HPMS	
Lane (#), Through	PennDOT, HPMS	
Lane (#), Peak if applicable	PennDOT, HPMS	
Lanes, (Turn Right, Turn Left)	PennDOT, HPMS	
Measured Pavement Roughness (IRI)	PennDOT, HPMS	
Present Serviceability Rating (PSR)	PennDOT, HPMS	
Rail Crossing Condition	PennDOT BOD	
Rail Crossing Warning Device	PennDOT BOD	
Shoulder Type	PennDOT, HPMS	
Shoulder Width, (Outer, Right, Left)	PennDOT, HPMS	
Speed Restrictions/Limit	PennDOT, HPMS	
Surface Pavement Type	PennDOT, HPMS	



## Appendix B – Asset Management

Highways (Steady State) Annual Costs				
Data sources: RMS for the quantity of roads and ECMS for our \$ needs to assign to each of the resources. The network has been broken down by County.				
	Interstates	NHS	Non-NHS >2000 ADT	Non-NHS <2000 ADT
Life Span	50 years	50 years	50 years	25 years
Annual cost	Cost of all treatment cycles/50 \$3,487,486/50 per lane mile= \$70,000x 5,700 lane miles= \$399,000,000 per year	Cost of all treatment cycles/50 \$3,097,486/50 per lane mile= \$62,000x 10,900 lane miles = \$676,000,000 (rounded) per year	Cost of all treatment cycles/50 \$1,173,486/50 per lane mile= \$23,470 per lane mile x 28,900 lane miles in net- work = \$665, 000,000 (rounded) per year	\$4,300 per lane mile x 43,900 lane miles= \$189,000,000 (rounded) per year
<b>Total Annual Cost</b>				<b>\$1,929,000,000</b>



## Appendix B – Asset Management

<b>Highways (Steady State) Treatment Cycles</b>			
Data sources: RMS for the quantity of roads and ECMS for our \$ needs to assign to each of the resources. The network has been broken down by County.			
<b>Interstates</b>	<b>NHS</b>	<b>Non-NHS &gt;2000 ADT</b>	<b>Non-NHS &lt;2000 ADT</b>
50 year life span	50 year life span	50 year life span	25 year life span
Begin w/reconstruct:	Begin w/reconstruct:	Begin w/betterment w/guiderail & drainage:	Initial high level treatment - 180 lb. leveling 1.5" hot mix asphalt:
Yr 5 – crack seal	Yr 5 – crack seal	Yr 5 – crack seal	
Yr 6 – microsurface	Yr 7 – shoulder cut	Yr 6 – microsurface	
Yr 7 – shoulder cut	Yr 6 – microsurface	Yr 7 – shoulder cut	
Yr 10 – crack seal	Yr 10 – crack seal	Yr 10 – crack seal	
Yr 14 – 2" mill & fill; shoulder cut & chip seal	Yr 14 – 2" mill & fill; shoulder cut & chip seal	Yr 14 – 2" mill & fill; shoulder cut & chip seal	Yr 0 – shoulder cut
Yr 18 – crack seal	Yr 18 – crack seal	Yr 18 – crack seal	Yr 7 – seal coat & shoulder cut
Yr 19 – microsurface	Yr 19 – microsurface	Yr 19 – microsurface	Yr 10 – crack seal
Yr 21 – shoulder cut	Yr 21 – shoulder cut	Yr 21 – shoulder cut	Yr 14 – seal coat
Yr 23 – crack seal	Yr 23 – crack seal	Yr 23 – crack seal	Yr 15 – shoulder cut
Yr 26 – 4" mill & fill; shoulder cut & chip seal	Yr 26 – 4" mill & fill w/ drainage updates; shoulder cut & chip seal	Yr 26 – 4" mill & fill; shoulder cut & chip seal	Yr 16 – crack seal
Yr 30 – crack seal	Yr 30 – crack seal	Yr 30 – crack seal	Yr 20 – seal coat
Yr 31 – microsurface	Yr 31 – microsurface	Yr 31 – microsurface	Yr 22 – crack seal; shoulder cut
Yr 33 – shoulder cut	Yr 33 – shoulder cut	Yr 33 – shoulder cut	Yr 25 – high level treatment
Yr 34 – crack seal	Yr 34 – crack seal	Yr 34 – crack seal	
Yr 38 – 2" mill & fill; shoulder cut & chip seal	Yr 38 – 2" mill & fill; shoulder cut & chip seal	Yr 38 – 2" mill & fill; shoulder cut & chip seal	
Yr 42 – crack seal & shoulder cut	Yr 42 – crack seal; shoulder cut	Yr 42 – crack seal; shoulder cut	
Yr 43 – microsurface	Yr 43 – microsurface	Yr 43 – microsurface	
Yr 50 – new pavmt	Yr 50 – new pavmt	Yr 50 – new pavmt	





## Appendix B – Asset Management

Bridges (Steady State)				
Date source: Published internet reports broken down by County (State-owned bridges 8' and greater; local bridges 20' and greater)				
	Replace- ment Cycle	Rehabilita- tion Cycle	Total Bridge Im- provement Cycle	Preservation (All Non-SD Deck Area)
Deck area in cycle	50% of all bridges	50% of all bridges	All bridges	
Cycle length	50 year (to next reha- bilitation)	50 year (to next re- placement)	100 year [rehab year 50, replacement year 100]	
Annual deck area	$(DA/2)/50$	$(DA/2)/50$	$DA/100$	
Cost	\$650/sf (fully loaded)	\$400/sf (fully loaded)	\$1050/sf (fully loaded) [replacement costs + rehab cost]	
Annual deck area cost	$(DA/2)/50 * \$650$	$(DA/2)/50 * \$400$	$DA/100 * \$1050$	\$1.75/sf DA (fully loaded) = \$156 million state-
Total Annual Bridge Costs				
Steady State Costs not addressed by SD Re- duction Annual Costs		[SD Reduction Annual Costs + Annual Steady State Preser- vation Costs] – [Annual Steady State Replacement Costs + Annual Steady State Rehabilitation Costs]		
Total Annual Costs (including Steady State)		SD Reduction Annual Cost + Steady-State Improvements not addressed with SD Reduction Annual Costs		



## Appendix B – Asset Management

SD Bridges (Reducing Backlog)	
	SD Reduction
Cost	\$650/sf
Annual Rate of SD On	State-owned bridges - 0.75% of total DA (assumes natural rate of 1.5% SD on, with preservation activities deferring 0.75%) Local-owned bridges - 1.5% (assumes no deferment for preservation)
Optimum SD Goal	State-owned bridges - 5% DA (only if current SD DA < 15%) Local-owned bridges - 8% DA (only if current SD DA < 15%)
General SD Goal	State-owned bridges - 8% (if current SD DA > 15% & < 24%) Local-owned bridges - 12% (if current SD DA > 15% & < 24%)
Maximum SD Goal	State-owned bridges - 1/3 of current SD DA (if current SD DA > 24%) Local-owned bridges - 1/2 of current SD DA (if current SD DA > 24%)
Timeline Goal	State-owned bridges: 10 years Local-owned bridges: 20 years
Required bridge improvements to reduce SD	$[\text{Actual SD DA} - \text{Goal SD DA}/\text{years to goal}] + \text{Annual SD On in DA} = \text{Total bridge improvements DA to reduce SD}$
Annual Cost	Total bridge improvement DA * \$650/sf



# Appendix B – Asset Management

Appurtenance Steady State						
Item		Amount	Replace- ment/other Cycle	Cost per unit		Yearly Cost
Sign Replacement		1.3 million signs statewide	12 yr	Approx. \$175 each (Approx. 110,000 signs replaced per year)		\$19,000,000 (rounded)
Guiderail	Wood posts cable guide-rail (old)	32,300,000 ft on non-NHS	25 yr	1,292,000 ft @ \$11.05	\$14,300,000	\$40,000,000
	End treat-ment	226,400 on non-NHS	25 yr	9,056 at \$1825	\$16,500,000	
		Add 30% for contract work vs. Dept. force				
Roadway Delinea- tion RPM (markers, lines, assets)		Traffic Line Painting		\$21,000,000		\$25,000,000
		All Weather Pavement Marking Program (AWPM)		\$4,000,000		
Retaining Walls						\$13,600,000
Highway Lighting						\$4,900,000
Drainage	Pipe Re-placem-ent	57 million ft	50 yrs	540,000 ft @ \$71.65 per ft	\$38,800,000	\$79,800,000
	Pipe Clean-ing	27 million ft	10 yrs	2,700,000 ft @ 5.24 per ft	\$14,100,000	
	Shoul-der Cut-ting		7 yrs	\$820.90 per lane mi	\$8,500,000	
		Add 30% for contract work vs. Dept. force				
Traffic Management		Complete ITS in Urban areas		\$50,000,000		\$74,000,000
		Deploy ITS in Rural areas		\$20,000,000		
		Provide statewide TMC		\$2,000,000		
		Enhance 511		\$2,000,000		
Total Cost Per Year						\$350,000,000



## Appendix B – Asset Management

Appurtenance Backlog Recovery Plan			
Item	Recovery Timeframe		Yearly Cost
Retaining Walls	25 yr		\$8,000,000
Highway lighting	State owned	\$1,700,000	\$2,400,000
	Local owned	\$700,000	
Total Backlog Cost Per Year			\$10,400,000



## Appendix B – Asset Management

Traffic Signal Cost Estimate Methodology		
Assumptions:	14,000 signals today	
	15,000 signals in 10 years	1%/yr new, 10% ^ over 10 yrs.
	New signal cost	\$125,000/Intersection
	Signal modernization	\$100,000/Intersection
	Retiming	\$7,500/Intersection
	Maintenance cost/intersection	\$3,500/yr./Intersection
	Operation cost-(energy)/intersection	\$1,500/yr./Intersection <sup>1</sup>
	State Program Administration	\$25,200,000 @ 15%/yr
Item	Estimated Cost/Year	Yearly Cost
Statewide Modernization and Optimization		
Cost/yr for new signals	140 per year*\$125,000 per signal	\$17,500,000
Signal modernization	13,170*\$100,000 per major upgrade*0.1 per year	\$137,100,000
Retiming (RET): Existing signal	13,710*\$7,500 per RET*2 retiming* 0.1 per year	\$20,570,000
Retiming: New signal	140 per year*10 yrs*1 RET*\$7,500 per RET*0.1 per year	\$10,290,000
Municipal Maintenance and Operations		
Maintenance cost	15,000*\$3500 per year	\$52,500,000
Operation (energy) cost	15,000*\$1500 per year	\$22,500,000
Yearly Total Estimated Cost (Statewide and Municipal)		
Statewide Modernization and Optimization		\$193,200,000
Municipal Maintenance Cost		\$75,000,000
Total Cost		\$286,200,000
<sup>1</sup> Use of LED would significantly reduce costs.		



## Appendix C – Project Prioritization & Selection

Project Characteristics	
Project Type	General Characteristics
Economic Development	<ul style="list-style-type: none"><li>-Improves access to airport or intermodal freight facility</li><li>-Leads to the redevelopment of a brownfield or in-fill development</li><li>-Assist tourism/recreational travel</li><li>-Enhances freight movement (truck percentage served, links to rail/freight yard or industrial parks)</li><li>-Improves mobility to job centers</li></ul>
Safety	<ul style="list-style-type: none"><li>-Reduces fatalities and serious injury crashes</li><li>-Reduces head-on and cross-median crashes</li><li>-Improves intersection safety</li><li>-Reduces run-off the road crashes</li><li>-Reduces the severity and frequency of hit fixed object crashes</li><li>-Enhances safety on local roads</li><li>-Improves pedestrian safety</li><li>-Improves bicycle safety</li><li>-Reduces vehicle speeds or traffic volumes (traffic calming)</li><li>-Enhances safety in work zones</li><li>-Reduces vehicle-train crashes</li></ul>
Security	<ul style="list-style-type: none"><li>-Improves bridge or roadway poor conditions on emergency or evacuation routes</li><li>-Avoids breakdowns or disasters (flooding, rock slides)</li><li>-Addresses geometric deficiencies</li><li>-Relieves recurrent congestion</li><li>-Improves emergency management</li></ul>
Accessibility and Mobility	<ul style="list-style-type: none"><li>-Reduces travel time</li><li>-Relieves congestion (CMS strategies)</li><li>-Improves information, convenience to users, intermodal linkages</li><li>-Extends alternative modes to an area previously served only by motor vehicles</li><li>-Optimizes existing capacity</li><li>-Minimizes conflicts between vehicle movements</li><li>-Increases access to bus and/or train stations</li><li>-Adds frequency and service of bus/train/rail</li><li>-Bicycle and pedestrian facilities</li><li>-Reduces the portion of heavy vehicle or commuter trips carried out on low classification roadways</li><li>-Improves signalization/signal progression</li></ul>



## Appendix C – Project Prioritization & Selection

Project Characteristics	
Project Type	General Characteristics
Environment	<ul style="list-style-type: none"><li>-Improves air quality/reduces Green House Gas (GHG)</li><li>-Eliminates vehicle trips (promotes bicycle, pedestrian, and transit facilities)</li><li>-Generates positive effect on water quality (limits impervious surfaces, runoff)</li><li>-Abates noise</li><li>-Uses recycled materials</li><li>-Aesthetics considered in design (context sensitive solutions, landscaping, visual easements, scenic overlooks)</li><li>-Incorporates preservation of recognized environmental resources</li><li>-Improves access to and appropriate use of designated environmental resources</li></ul>
Integration and Connectivity	<ul style="list-style-type: none"><li>-Supports redevelopments, infill and mixed use development in existing activity centers</li><li>-Promotes intermodalism (use of alternative modes, park and ride lots, access to transit/rail, bicycle and pedestrian facilities, feeder service, signage, airports)</li><li>-Eliminates major barriers in regional corridor; provides gap closure, links jurisdictions, and connects major activity centers</li><li>-Provides linkages to other regional systems and states</li><li>-Removes height or weight restrictions</li></ul>
Management/Operations/Intelligent Transportation Systems	<ul style="list-style-type: none"><li>-Results of or establishes multi-municipal or public/private partnership</li><li>-Supports coordination of land use transportation systems</li><li>-Reduces existing/prevents future congestion (Improves flow, reduces travel time)</li><li>-Reduces single occupancy vehicle (SOV) trips and promotes transit</li><li>-Promotes access management</li><li>-Reduces vehicular stops</li></ul>
System Preservation	<ul style="list-style-type: none"><li>-Optimal replacement cycle/delays need for repair/reconstruction</li><li>-Reduces truck vehicle miles traveled (VMT), diverts heavy truck traffic</li><li>-Facility or fleet replacement or modernization</li><li>-Traffic signals and railroad grade crossing improvements</li></ul>
Air quality	<ul style="list-style-type: none"><li>-Reduces pollution emissions by use of technology including alternative fuels hybrid vehicles, engine retrofits, and advanced truck technologies</li><li>-Improves traffic flow, but does not add lanes/capacity or relocate facilities</li><li>-Reduces vehicle miles traveled (VMT), discourages single occupancy vehicles (SOV)</li><li>-Reduces congestion or supports transit and more compact development</li><li>-Reduces truck idling or improves truck way-finding</li><li>-Includes bicycle and pedestrian projects</li></ul>





## Appendix C – Project Prioritization & Selection

The following tables show examples of criteria for the preliminary project type based evaluations of projects.

Highway - Restoration	
Project Criteria	Guidelines
What network is the project on	-Is the project on a core transportation system and/or in a regional growth investment area?
What is the AADT	-On average, how many vehicles use the highway per day?
What is the IRI	-How smooth is the pavement? What is the condition of the pavement if available?
Percentage of Trucks	-Out of all the vehicles using the highway, what is the percentage of trucks?
Resurfacing Date	-How many years ago was the highway last resurfaced? Reconstructed?
Highway – New Capacity/Roadway	
Project Criteria	Guidelines
What network is the project on	-Is the project on a core transportation system and/or in a regional growth investment area?
Project Effectiveness	-Does the project significantly address the congestion and mobility issues of the existing roadway?
Supporting Business Growth	-Does the project support existing or emerging businesses and industries? -Does it attract new businesses and industries to the region?
Percentage of Trucks	-Out of all the vehicles using the highway, what is the percentage of trucks?
Cost Factors	-Is the cost reasonable and can it be afforded based upon financial guidance? -Can the project be afforded out of the TIP? -Does the project cost consider inflation and year of expenditure? -Have other funding sources been considered (i.e. private-public partnerships, incentives, etc.)?



## Appendix C – Project Prioritization & Selection

State Bridges > 8 Feet	
Project Criteria	Guidelines
What network is the project on?	-Is the project on a core transportation system and/or in a regional growth investment area?
Bridge Risk Assessment Score	-Is the bridge one of the top 100 highest risk bridges?
Structurally Deficient	-Is the bridge structurally deficient?
Critical to commerce or emergency access?	-Is the bridge on a primary route for emergency responders? -Is it used by school buses or does it provide access to businesses or industry?
Posted or Closed	-Does the bridge have a posted weight limit or is it closed? -What length of detour is imposed if the structure is closed? -Does the bridge provide sole access for one or more homes, businesses, or facilities?
Percentage of Trucks	-Out of all the vehicles using the highway, what is the percentage of trucks?
Bridge Inspection	-When was the last bridge inspection report completed?
Date of Last Improvement	-When was the date of last expenditure of federal funds on the structure?



## Appendix C – Project Prioritization & Selection

Local Bridges > 20 Feet	
Project Criteria	Guidelines
The municipality has the local match?	-Does the municipality have the match or a source for the match?
What is the AADT?	-On average, how many vehicles use the bridge per day?
Is the bridge deficient?	-Will the project preserve a bridge to keep it from becoming SD or will it replace an SD bridge?
Critical to commerce or emergency access?	-Is this bridge the primary route for emergency access, school buses, or to access a business? Is the length of the detour significant?
Posted or Closed	-Does the bridge have a posted weight limit or is it closed? -What length of detour is imposed if the structure is closed? -Does the bridge provide sole access for one or more homes, businesses, or facilities?
Percentage of Trucks	-Out of all the vehicles using the highway, what is the percentage of trucks?
Bridge Inspection	-When was the last bridge inspection report completed?
Date of Last Improvement	-When was the date of last expenditure of federal funds on the structure?



## Appendix C – Project Prioritization & Selection

Safety	
Project Criteria	Guidelines
What network is it on	-Is the project on a core transportation system and/or in a regional growth investment area?
What is the AADT	-On average, how many vehicles use the asset per day?
High Crash Location	-Is the project identified on the MPO/RPO High Crash Location List? (PennDOT BHSTE)
Project Effectiveness	-How well does the project effectively address the crash causation at the location? -Does the project incorporate countermeasures to reduce crashes? -What would be the crash reduction after the completion of the project?
Field View	-Did the field view indicate that this project would reduce crashes?
Transportation Enhancements/Home Town Streets/Safe Routes to Schools	
Project Criteria	Guidelines
Design Standards	-Is the project consistent with PennDOT design and/or other industry standards?
Matching funds	-Are matching funds available from the project sponsor or have they identified a source of funds to use as the match?
Project Readiness	-Is the project currently under design or has a bid package been prepared?
Potential Benefits/Impacts	-Does the project provide a positive impact on the quality of life or promotes other modes of transportation?
Other Beneficial Values	-Does the project serve as part of a larger community initiative?



## Appendix C – Project Prioritization & Selection

The table below is sample of what could be used in the second set of criteria.

Overall Transportation Criteria	
Project Criteria	Guidelines
Statewide Long Range Transportation Plan	-Is the proposed project consistent with the goals and objectives of the statewide long range transportation plan?
County or Multi-municipal Comprehensive Plan	-Is the proposed project on one or more County or Multi-municipal Comprehensive Plans or consistent with specific actions/strategies recommended in those plans?
Intermodal Benefits	-Does the proposed project support or provide intermodal benefits? Is the project on a transit route or an intermodal connector?
Public/Private Involvement	-Is there municipal or private funding offered as part of the project? If so, what percentage of the project would be funded?
Leadership and Political Support	-What level of leadership and political support does the project have?
Maximizes Existing Infrastructure	-Does the project require the development of new infrastructure, or does it improve existing infrastructure?
Environmental	-What types of resources are impacted? -What is the level of environmental impacts?
Land Use	-Does or will the project impact the existing land use or require the addition of right of way? -Does or will the municipality or county have land use controls in place? -Does the project utilize the context sensitive solution approach? -How does the project impact land use and community character/loss?
Vehicle Trip Reduction	-Does the project encourage the reduction of motor vehicle trips and SOVs? -Has Transit Oriented Development (TOD) been considered?
Promotes Other Modes	-Does the project promote the use of other modes of transportation? If so, which ones?
Community/Regional Benefits	-Does the project provide positive impacts on one or more communities? -How broad is that impact, how many communities benefit?
Travel Time	-Does the project improve travel time/reduce energy consumption?
Emergency Vehicle Access	-Does the project improve access for emergency vehicles and does it reduce their travel time?
Safety	-Does this project improve safety? -What safety issue or deficiency does the project solve? -Is the project identified in an existing safety plan?



## Appendix D – Environmental GIS Data

### Environmental Resource GIS Data Sources

Layer	Source
<b>Project Development</b>	
TIP Projects	PennDOT (MPMS)
ARRA Projects	PennDOT (MPMS)
CMP Corridors	MPO GIS
<b>Transportation</b>	
Road Shields	PennDOT (RMS)
Traffic Signals	PennDOT (BHSTE)
Transit Nodes	MPO GIS
Transit Routes	Transit Agency/MPO GIS
Interstate Highway Exits	PennDOT (BPR)
Roads (State)	PennDOT (BPR)
Roads (Local)	PA Spatial Data Access (PASDA)
State Bridges	PennDOT (BPR)
Local Bridges	PennDOT (BPR)
Bridge Events	PennDOT (BMS)
Segment Events	PennDOT (RMS)
Traffic Events	PennDOT (RMS)
Administrative Events	PennDOT (RMS)
Phase View Events	PennDOT (MPMS)
Project View Events	PennDOT (MPMS)
Projects View Events	PennDOT (MPMS)
<b>County</b>	
Centerline	County GIS
Railroad	County GIS
<b>Geography</b>	
Geographic Name Information System	US Geological Survey
Municipal Boundaries	County GIS
Plan Development Sections	MPO (County Municipal Boundaries GIS)



## Appendix D – Environmental GIS Data

### Environmental Resource GIS Data Sources

Layer	Source
<b>Geography cont.</b>	
Building Points	County GIS
Landmarks	County GIS
<b>Cadastre</b>	
Parcel Data	County GIS
<b>Community Facilities</b>	
Public Facilities	County GIS
Public Schools	County GIS
Private Schools	County GIS
School Districts	PASDA
<b>Cultural Resources</b>	
Historical Features	PA Historical and Museum Commission (PHMC)
Archaeological Survey Sights	PHMC
Known Archaeological Sights	PHMC
Cemeteries	County GIS
<b>Demographics</b>	
Environmental Justice Areas	PASDA
Block Groups	Census Bureau
Tracts	Census Bureau
Urbanized Areas	Census Bureau
Traffic Analysis Zones	Census Bureau
<b>Geology</b>	
Geology Dike	PA Bureau of Topological and Geological Survey (DCNR)
Geological Formations	PASDA
Karst (Sinkhole) Geology	PASDA
Slopes	MPO GIS





## Appendix D – Environmental GIS Data

### Environmental Resource GIS Data Sources

Layer	Source
<b>Hazmats</b>	
Brownfields	PASDA
Land Recycling Locations	PASDA
Commercial Hazard Waste Operations	PASDA
Municipal Waste Operations	PASDA
Storage Tanks	PASDA
<b>Hydrology</b>	
Rivers	County GIS
Regional Hydrology	County GIS
Class A Streams	PASDA
Steams-CH93 Designated Use	PASDA
Streams-CH93 Existing Use	PASDA
Lakes with Total Maximum Daily Load	PASDA
Streams with Total Maximum Daily Load	PASDA
Integrated List Non-Attaining	PASDA
Trout Natural Reproduction	PASDA
Wild Trout Streams	PASDA
National Wetlands Inventory	PASDA
Watersheds	DEP
Q3 Flood Plains	FEMA
<b>Existing Land Use</b>	
Existing Land Use	County GIS
<b>Future Land Use</b>	
Future Land Use	County GIS
<b>Agriculture Security Easements</b>	
Agriculture Security Areas	County GIS
<b>Agriculture Easements</b>	
Agriculture Easement Areas	County GIS



## Appendix D – Environmental GIS Data

### Environmental Resource GIS Data Sources

Layer	Source
<b>Easements: Other</b>	
Other Conservation Districts	County GIS
<b>The Conservation Fund Protected Land Inventory (PLI)</b>	
PLI County Local	PASDA
PLI County Agriculture Easements	PASDA
PLI Federal	PASDA
PLI Nonprofit and Private Lands	PASDA
PLI State Lands	PASDA
<b>Local Points of Interest</b>	
Office Parks	MPO GIS
Warehouse and Distribution Centers	MPO GIS
Truck Terminals	MPO GIS
Planned Growth Areas	MPO GIS
Community Service Areas	MPO GIS
Rural Focus Areas	MPO GIS
Regional Growth Areas	MPO GIS
<b>Natural Resources</b>	
PA Wilds and Natural Areas	PASDA
<b>Natural Areas Inventories (NAI)</b>	
NAI Polygons	PA Science Office of The Nature Conservancy
NAI Forest Blocks	PA Science Office of The Nature Conservancy
<b>Recreation</b>	
Parks/Playgrounds	Variable
State Park Boundaries	PASDA
State Forrest Lands	PASDA
State Game Lands	PASDA
Water Trails	PASDA
Appalachian Trail	PASDA



## Appendix D – Environmental GIS Data

### Environmental Resource GIS Data Sources

Layer	Source
<b>Recreation Continued</b>	
Appalachian Trail	PASDA
Trails	MPO GIS
State Lands	PASDA
<b>Soils</b>	
Hydric Soils	Natural Resource Conservation Service Soil Data Mart
Prime and Unique Farmland Soils	Natural Resource Conservation Service Soil Data Mart
Septic	Natural Resource Conservation Service Soil Data Mart
Soil Areas	Natural Resource Conservation Service Soil Data Mart
<b>Utilities</b>	
Water Resource Utilities	PASDA
Public Water	MPO GIS
Public Sewer	MPO GIS
<b>Zoning</b>	
Zoning	County GIS



## Appendix E – Regional LRTP Plan Links

### **Pennsylvania Long Range Transportation Plan Links**

Adams County: Adams County Comprehensive Plan

Berks County: FFY 2009-2030 Long Range Transportation Plan and Air Quality Conformance Analysis

Blair County: Long Range Transportation Plan for Blair County 2007-2031

Cambria County: Johnstown MPO Long Range Transportation Plan 2007-2035

Centre County: Centre County Long Range Transportation Plan 2030

DVRPC: Connections 2035

Erie County: Erie County 2030 Transportation Plan

Fulton County: Moving Fulton Forward A Joint Comprehensive Plan

Lackawanna and Luzerne Counties: Come Shape the Future-Lackawanna and Luzerne Counties Comprehensive Plan, Long Range Transportation Plan and Hazard Mitigation Plan

Lancaster County: Connections 2009-2035 Long Range Transportation Plan

Lebanon County: Lebanon County 2009-2034 Long Range Transportation Plan

Lehigh Valley: Lehigh Valley Surface Transportation Plan 2007 - 2030

Lycoming County: WATS Long Range Transportation Plan 2007-2026

Mercer County: Mercer County Long Range Transportation Plan

North Central PA RPDC: North Central Pennsylvania 2007-2035 Long Range Transportation Plan

Northern Tier RPDC: Long Range Transportation Plan 2009-2035

Northwest PA RPDC: 2007-2032 Long Range Transportation Plan

SPC: 2035 Transportation and Development Plan for Southwestern Pennsylvania

Tri-County: 2030 Regional Transportation Plan

York County: 2009-2035 York County Long Range Transportation Plan (LRTP)



## Appendix F – Regional PPP Links

### **Pennsylvania Public Participation Plan Links**

[Berks County: Public Participation Plan](#)

[Blair County: Public Participation Plan](#)

[Cambria County: Public Participation Plan](#)

[Centre County: Public Participation Plan](#)

[Erie County: Public Participation Plan](#)

[DVRPC: Public Participation Plan](#)

[Lebanon County: Transportation Planning Process Public Involvement Policy](#)

[Lehigh Valley Transportation Study: Public Participation Plan](#)

[Lackawanna/Luzerne Counties: Public Involvement Plan](#)

[Lycoming County: Public Participation Plan](#)

[North Central: Public Participation Plan](#)

[Northern Tier: Public Involvement Plan](#)

[Shenango Valley: Public Participation Plan](#)

[SPC: Public Participation Plan](#)

[Tri-County: Public Education and Public Involvement Plan](#)

[York County: Public Involvement Plan](#)



## Appendix G – Acronym Glossary

### Acronym Glossary

**AADT:** Annual Average Daily Traffic

**AASHTO:** American Association of State Highway and Transportation Officials

**ACM:** Agency Coordination Meeting

**ACS:** American Community Survey

**BHSTE:** Bureau of Highway Safety and Traffic Engineering

**BMS:** Bridge Management System

**BOD:** Bureau of Design

**BOMO:** Bureau of Maintenance and Operations

**BPR:** Bureau of Planning and Research

**CAA:** Clean Air Act

**CE:** Categorical Exclusion

**CFR:** Code of Federal Regulations

**CMP:** Congestion Management Process

**CPTS:** Core Pennsylvania Transportation System

**DCNR:** Department of Conservation and Natural Resources

**DEP:** Department of Environmental Protection

**EA:** Environmental Assessment

**EIS:** Environment Impact Statement

**EJ:** Environmental Justice

**EPA:** Environmental Protection Agency

**FAA:** Federal Aviation Administration

**FHWA:** Federal Highway Administration

**GIS:** Geographic Information System

**FTA:** Federal Transit Administration



## Appendix G – Acronym Glossary

**HPMS:** Highway Performance Monitoring System

**I\M:** Inspection and Maintenance

**IAP2:** International Association from Public Participation

**ICAT:** Intermodal Corridor Assessment Tool

**ISTEA:** Intermodal Surface Transportation Efficiency Act

**IRI:** International Roughness Index

**ITS:** Intelligent Transportation System

**LRTP:** Long Range Transportation Plan

**LUTED:** Land Use, Transportation, and Economic Development

**MGT:** Million Gross Tons

**MOU:** Memorandum of Understanding

**MPC:** Municipalities Planning Code

**MPO:** Metropolitan Planning Organization

**MSA:** Metropolitan Statistical Area

**NAAQS:** National Ambient Air Quality Standards

**NEPA:** National Environmental Policy Act

**NHS:** National Highway System

**OPI:** Overall Pavement Index

**PAC:** Program Advisory Committee

**PASDA:** Pennsylvania Spatial Data Access

**PASDC:** Pennsylvania State Data Center

**PEMA:** Pennsylvania Emergency Management Agency

**PennDOT:** Pennsylvania Department of Transportation

**PHMC:** Pennsylvania Museum and Historical Commission

**PPP:** Public Participation Plan





## Appendix G – Acronym Glossary

**PS&E:** Plans, Specifications & Estimates

**PSP:** Pennsylvania State Police

**RMS:** Roadway Management System

**ROP:** Regional Operations Plan

**RPO:** Rural Planning Organization

**RTMC:** Regional Traffic Management Centers

**SAFETEA-LU:** Safe, Accountable, Flexible, Efficient, Transportation Equity Act-A Legacy for Users

**SASP:** State Aviation System Plan

**SD:** Structurally Deficient

**SEPTA:** Southeastern Pennsylvania Transportation System

**SOV:** Single Occupancy Vehicle

**STAMPP:** Systematic Technique to Analyze and Manage Pennsylvania Pavements

**STC:** State Transportation Commission

**STIP:** Statewide Transportation Improvement Program

**TE:** Transportation Enhancements

**TEA-21:** Transportation Equity Act for the 21<sup>st</sup> Century

**TIGER:** Topologically Integrated Geographic Encoding and Referencing

**TIP:** Transportation Improvement Program

**TMA:** Transportation Management Area

**TRB:** Transportation Research Board

**TYP:** Twelve-Year Program

**USDOT:** United States Department of Transportation

**VMT:** Vehicle Miles Traveled

**YOE:** Year of Expenditure



### Glossary

**Agency Coordination Meeting (ACM):** A meeting of various state and federal transportation and environmental agencies to review project status and issues. This meeting involves agencies during a project's development. The resource agencies are: Pennsylvania Department of Environmental Protection, Pennsylvania Department of Agriculture, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Pennsylvania Historical and Museum Commission, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service.

**Air Quality Conformity:** The link between air quality planning and transportation planning.

**Alternative:** Any one number of transportation proposals for a project including: no-build, new alignment (offline), and network upgrade (online). Alternatives are developed during the preliminary alternatives analysis phase.

**Alternative Fuels:** The Energy Policy Act of 1992 defines alternative fuels as methanol, denatured ethanol, and other alcohol; mixtures containing 85% or more (but not less than 75% as determined by the Secretary of Energy to provide for requirement relating to cold start, safety, or vehicle functions) by volume by methanol, denatured ethanol, hydrogen, coal-derived liquid fuels, fuels other than alcohols derived from biological materials, electricity, or any other fuels the Secretary of Energy determines by rule is substantially not petroleum and would yield substantial energy security and environmental benefits.

**Alternatives Analysis:** Preliminary engineering and environmental studies of a wide range of alternatives. The object of this analysis is to reduce the number of alternatives for more detailed study, and then, after substantial and detailed engineering and environmental studies, to select a preferred alternative.

**Asset Management:** The strategic framework for managing transportation infrastructure, aligning resource allocation to maintain and/or improve the system to a specific level.

- Includes a systematic process for monitoring, evaluation, investment analysis, and stakeholder feedback.
- Provides input to short & long range planning to allocate available resources to preserve and improve the existing transportation system.
- Maximizes the benefits to its owners and users over the longest time period using available resources.

**Average Daily Traffic Volume (ADT):** The average number of vehicles that travel on a road during the day. To calculate the ADT, traffic engineers take the total traffic volume during a given time period in whole days (24-hour periods) and divide it by the number of days in that time period.



## Appendix H – Glossary

**Bridge Management System (BMS):** PennDOT maintained inventory of all state bridges greater than 8 feet in length and all local bridges greater than 20 feet in length. The BMS inventory consists of detailed information of all listed bridges, in terms of their location, statistics, engineering specifications, and other related items.

**Bridge Risk Assessment Tool:** Tool to assess and manage risk level of bridges to maintain a functional, cost effective, and safe transportation system. Development risk scores includes the following factors:

- **Structurally Deficient Risk Score:**
  - Determination of Risk Level: Type of structure (fracture critical), network, and current condition rating for structural elements
  - Application of Importance Factors: Size, feature under structure, ADT (total), ADT (truck), scour condition, detour length
  - Weighted Composite Risk Scores
- **Overall Risk Scores Prioritized (by score value):**
  - Statewide ranking
  - District ranking
  - Final District ranking based on regional priority and adjusted for other impacts (i.e. critical route for schools, hospitals, etc.)

**Business Plan Network:** PennDOT roadway classification system for the purpose developing District Business Plans and system monitoring.

- **Interstate:** Federally designated freeway routes meeting the Interstate geometric and construction standards for future traffic. The highest classification of arterial roads, providing the highest level of mobility, at the highest speed, for a long uninterrupted distance.
- **National Highway System (Non-Interstate):** Federally designated principal arterials, not categorized as Interstates, serving major population centers and intermodal transportation facilities.
- **Non-National Highway System  $\geq$  2000:** Comprised of state-owned roadways that are not federally designated which have an annual average daily traffic (AADT) of 2000 or more vehicle per day.
- **Non-National Highway System  $<$  2000:** Comprised of state-owned roadways that are not federally designated which have an annual average daily traffic (AADT) of less than 2000 or vehicle per day.

**Capacity:** The capacity of a facility (such as a freeway or signalized intersection) is defined as the maximum hourly rate at which persons or vehicles can reasonably be expected to traverse a uniform section of a roadway during a given time period under prevailing roadway, traffic, and control conditions. Capacity is usually expressed in vehicles per hour.

**Categorical Exclusion Evaluation (CE):** Environmental documentation required by NEPA for federally-aided projects that do not have a significant effect on the environment.



## Appendix H – Glossary

**Comprehensive Plan:** The general, inclusive, long range plan for future development of a community. The plan identifies needed infrastructure improvements and funding needs for future capital improvements in an area.

**Conformity:** The U.S. Clean Air Act stipulates that any approved transportation project, plan, or program must conform to the State Implementation Plan, a document which prescribes procedures for the implementation, maintenance and enforcement of primary and secondary pollutants.

**Congestion Management Process:** A systematic approach, collaboratively developed and implemented throughout a metropolitan region, that provides for the safe and effective management and operation of new and existing transportation facilities through the use of demand reduction and operational management strategies.

**Corridor:** Land between two termini within which traffic, transit, land use, topography, environment and other characteristics are evaluated for transportation purposes.

**Cumulative Effects:** As it relates to NEPA, Cumulative Effects are effects that result from adding the impacts of an action to other past, present, and reasonably foreseeable future actions, regardless of which agency (federal or non-federal) or person undertakes the individual actions.

**Design Criteria:** State and national standards and procedures that guide the establishment of roadway layouts, alignments, geometry, and dimensions for specified types of roadways in certain defined conditions. The principal design criteria for roadways are traffic volumes, design speed, the physical characteristics of vehicles, the classification of vehicles, and the percentage of various vehicle classification types that use the roadway.

**Design Year:** The year for which a roadway facility is designed, normally 20 years after planned completion, taking into consideration projected volumes of traffic.

**Detailed Alternatives Analysis:** Intensive engineering and environmental studies of a small range of alternatives that are modified during this analysis to avoid or minimize disruptions to environmental resources. The objective of this analysis is to select a preferred alternative.

**Direct Effects:** Influences or occurrences caused by a given action and occurring at the same time and place as the action. Changes in noise levels, traffic volumes, or visual conditions are some examples of direct effects of a new highway.

**Environmental Features:** Significant resources, facilities, or other features of a study area that serve to restrain, restrict, or prevent the implementation of proposed transportation improvements in a given area. Features may include natural or physical resources, important structures, communities' facilities, or topographic features.



## Appendix H – Glossary

**Environmental Justice:** The fair treatment and meaningful involvement of all people regardless of race, color, national origin or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. (U.S. Environmental Protection Agency)

**Environmental Overview:** A beginning inventory or summary assessment of environmental features in a study area, usually performed during systems planning or preliminary environmental activities. From this preliminary information, the environmental impacts of the study alternative will be determined. This overview may sometimes be referred to as Environmental Screening.

**Environmental Protection Agency (EPA):** The federal agency responsible for enforcing federal environmental regulations such as the National Environmental Policy Act, Clean Air Act and Clean Water Act.

**Federal Highway Administration:** Federal agency responsible for overseeing the use of Federal funds for a variety of roadway, bridge, and other transportation programs; One agency of the U.S. Department of Transportation.

**Federal Transit Administration:** Formerly known as the Urban Mass Transportation Administration (UMTA), Federal agency responsible for overseeing the use of Federal funds for a variety of public transportation programs; One agency of the U.S. Department of Transportation.

**Fiscal Year:** Federal fiscal year is October 1 to September 30; State fiscal year is July 1 to June 30.

**Geographic Information System:** A computer-based system that links the geographic location of map features to text information or databases.

**Historic Resource:** A building, structure, site, district or object which is significant in American history, architecture, archaeology, engineering and culture.

**Hydric Soils:** Soil that is saturated or flooded long enough during the growing season to develop conditions which indicate the possible presence of wetlands.

**Impacts:** Positive or negative effects upon the natural or human environment resulting from transportation projects.

**Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA):** Previous Federal legislation authorizing the expenditure of Federal funds for transportation improvement projects; It was a six-year bill.



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**International Roughness Index (IRI):** The worldwide standard for measuring pavement smoothness. The index measures pavement roughness in terms of the number of inches per mile that a laser, mounted in a specialized van, jumps as it is driven across a single wheel path of the road surface. The lower the IRI number, the smoother the ride.

- **Average IRI:** The numeric value approximating the statistical norm of any series of roadway segments.
- **Median IRI:** The numeric value separating the higher half of any series of roadway segments from the lower half.
- **Excellent IRI:** Interstate  $\leq 70$ ; NHS  $\leq 75$ ; ADT  $\geq 2,000 \leq 100$ ; and ADT  $< 2,000 \leq 120$ ;
- **Good IRI:** Interstate  $\leq 100$ ; NHS  $\leq 120$ ; ADT  $\geq 2,000 \leq 150$ ; and ADT  $< 2,000 \leq 170$ ;
- **Fair IRI:** Interstate  $\leq 150$ ; NHS  $\leq 170$ ; ADT  $\geq 2,000 \leq 195$ ; and ADT  $< 2,000 \leq 220$ ;
- **Poor IRI:** Interstate  $\geq 151$ ; NHS  $\geq 171$ ; ADT  $\geq 2,000 \geq 196$ ; and ADT  $< 2,000 > 220$ .

**Level of Service (LOS):** A qualitative rating of the effectiveness of a transportation component (such as a freeway or a signalized intersection) measured in terms of operating conditions. The Highway Capacity Manual identifies operating LOS ranging from "A" to "F", briefly described below for signalized intersections:

- **LOS A** - Excellent traffic flow, favorable progression, most vehicles do not stop at all.
- **LOS B** - Very good traffic flow, short delays, more vehicles stop than under LOS A, causing higher levels of delay.
- **LOS C** - Traffic flow is still good, but the number of vehicles stopping is significant. Many vehicles still proceed without stopping.
- **LOS D** - The influence of congestion becomes noticeable. Few vehicles advance through the intersection without stopping.
- **LOS E** - Virtually no vehicles proceed without stopping. The limit of acceptable delay for many agencies.
- **LOS F** - Traffic volume exceeds available capacity. All vehicles must stop at least once, and possibly must wait through several signal cycles before proceeding.

**Local Development District (LDD):** A federal designation given to agencies which are responsible for handling Appalachian Regional Commission funds for their region.

**Logical Termini:** The rational beginning and ending point of a transportation project that enhance good planning and serve to make the proposed improvement usable.

**Metropolitan Planning Organization:** Required by Federal law for all urbanized areas over 50,000 in population in the United States; Responsible for a coordinated, comprehensive, and continuous transportation planning program; Must approve the use of Federal funds for projects in its geographic area, and prepare and maintain a long range transportation plan.



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**National Environmental Policy Act of 1969 (NEPA):** The federal law that requires the preparation of specific environmental documentation for major undertakings using federal funds. To comply with NEPA, PennDOT developed a 10-step process to address all potential environmental, social, cultural and economic impacts of a proposed highway project before decisions are reached on design. Public involvement is an integral component of this process.

**Natural Resources:** Resources, such as wetlands, wildlife, streams, aquatic life, etc., which must be considered in the development of NEPA documentation.

**Out-of-Cycle:** Facilities that deviate from the established asset treatment cycles including activities designed to increase or optimize expected average life, replacement, or reconstruction.

**Overall Pavement Index (OPI):** A rating scale ranging from 0 (worst) to 100 (best) used to evaluate and prioritize maintenance, rehabilitation, and reconstruction of the highway system on an annual basis. The OPI was first developed in 1988. It includes the following factors:

- **Ride Index (45%):** International Roughness Index (IRI);
- **Structural Index (30%):** 20% transverse cracking, 15% transverse joint spalling, 15% joint faulting, 25% broken slab, 20% bituminous patching, and 5% surface defect;
- **Surface Distress Index (20%):** 15% joint seal failure, 25% longitudinal joint spalling, 20% transverse cracking, 20% transverse joint spalling, 15% surface defects, and 5% rutting;
- **Safety index (5%):** 5% longitudinal joint spalling, 5% transverse cracking, 10% transverse joint spalling, 5% faulting, 5% broken slab, 10% bituminous patching, 20% surface defect, 20% rutting, and 20% shoulder dropoff.

**Pennsylvania Department of Conservation and Natural Resources (PA DCNR):** Established on July 1, 1995, the agency is charged with maintaining and preserving the 116 state parks; managing the 2.1 million acres of state forest land; providing information on the state's ecological and geologic resources; and establishing community conservation partnerships with grants and technical assistance to benefit rivers, trails, greenways, local parks and recreation, regional heritage parks, open space and natural areas.

**Pennsylvania Department of Environmental Protection (PA DEP):** The Department of Environmental Protection's mission is to protect Pennsylvania's air, land and water from pollution and to provide for the health and safety of its citizens through a cleaner environment. We will work as partners with individuals, organizations, governments and businesses to prevent pollution and restore our natural resources. This agency is responsible for enforcing state environmental regulations.

**Pennsylvania Department of Transportation (PennDOT):** PennDOT is responsible for the integration of programs and policies for all transportation modes. PennDOT's direct responsibilities include the maintenance, restoration and expansion of the state-owned system of 40,500 miles of highways and 25,000 bridges.





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**Pennsylvania Fish and Boat Commission (PFBC):** The mission of the PA Fish and Boat Commission is to provide fishing and boating opportunities through the protection and management of aquatic resources. As partners in transportation development, PFBC provides PennDOT with information on the location of Pennsylvania's trout stock fisheries, as well as streams and rivers where endangered species of aquatic biota have been identified.

**Pennsylvania Game Commission (PGC):** Under the provisions of PA Game Law, this independent administrative agency is directed to "...protect, propagate, manage and preserve the game, forbearing animals, and protected birds of the State..." The PA Game and Wildlife Code confers upon the Game Commission executive jurisdiction over the administration and management of all the state's wildlife resources. The Game Commission participates in the review of major transportation projects that have the potential to affect wildlife resources, but it does not exercise regulatory authority over these projects.

**Pennsylvania Historical & Museum Commission (PHMC):** Through its Bureau for Historic Preservation, PHMC is responsible for identifying, evaluating and protecting historic resources in the Commonwealth of Pennsylvania. In Pennsylvania, PHMC is the State Historic Preservation Officer (SHPO).

**Preliminary Alternatives Analysis:** A wide range of preliminary alternatives is first developed and evaluated based on preliminary engineering and environmental studies. The objective of this analysis is to reduce the number of alternatives for more detailed study in the Detailed Alternatives Analysis.

**Preliminary Engineering:** Early phases of technical studies undertaken to determine all relevant aspects of transportation location, to identify feasible route alternatives or design options, and to assess various cost and benefit parameters before advancing the project into more detailed final design development.

**Public Meeting:** An announced meeting conducted by transportation officials designed to facilitate participation in the decision-making process and to assist the public in gaining an informed view of a proposed project. Such a gathering may be referred to as a Public Information Meeting.

**Regional Long Range Transportation Plan:** Federal law requires that the Commonwealth of Pennsylvania and Metropolitan Planning Organizations adopt and update a long range transportation plan to cover a period of at least twenty years.

**Regional Operations Plan:** A plan which lays out the strategic transportation operations program for the region, including specification of regional projects. The program delineated in the ROP is to be implemented and mainstreamed in transportation planning documents and day-to-day activities.



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**Resource Agencies:** A group of approximately ten federal and state agencies or commissions which review projects for their consistency and sensitivity to environmental laws and policies. Regulatory agencies are empowered to issue permits or recommend approval or denial of a permit.

**Roadway Management System (RMS):** PennDOT's primary means for defining and monitoring the State-owned highway network, maintaining an inventory of the roadway features, conditions, and characteristics, and providing decision-makers with the information that is necessary for funding, business planning, project design, and maintenance programming.

**Rural Planning Organization:** Name for the transportation planning entity of a non-metropolitan region; Consistent with Local Development Districts; Acts the same as MPOs for rural areas in Pennsylvania.

**Safe, Accountable, Flexible, Efficient, Transportation Equity Act:** A Legacy for Users (SAFETEA-LU): Federal legislation authorizing the expenditure of Federal funds for transportation improvement projects; A five-year bill signed into law in August 2005.

**State Transportation Commission:** Created by Act 120 of 1970 to be responsible for adopting the state's Twelve Year Transportation Program; Comprised of fifteen members; Chaired by the Commonwealth's Secretary of Transportation, with four members from the state legislature and ten members appointed by the Governor.

**Statewide Long Range Transportation Plan:** Federal transportation policy requires state departments of transportation (DOTs) to develop a long range transportation plan (LRTP) that articulates transportation policy for the state, addressing all applicable transportation modes and covering eight planning areas: economic vitality, safety, security, mobility and accessibility for persons and freight, system integration and coordination, environmental protection, system management and operation, and system preservation.

**Statewide Transportation Improvement Program:** Document required by Federal law, by which states submit list of projects illustrating use of Federal funds; Usually updated every two years; In Pennsylvania, comprised of TIPs from all MPO and RPO areas; Must be fiscally constrained.

**Structurally Deficient (SD):** Indication of bridge's overall status in terms of structural soundness and ability to service traveling public. "SD" indicates that the bridge has deterioration to one or more of its major components. (NOTE: A structurally deficient bridge is safe, but in need of costly repairs or replacement to bring it to current standards.)

- **SD by Bridge:** The total number of bridges meeting the definition of structurally deficient in a given sample.
- **SD by Deck Area:** Total square foot deck area meeting the definition of SD/total square foot deck area of all bridges in a given sample.



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### **Systematic Technique to Analyze and Manage Pennsylvania Pavements**

**(STAMPP):** Index based on the total cost of each county of standardized repair strategies sufficient to correct the existing pavement and shoulder distress conditions as determined by a field survey or VideoLog. The STAMPP index for a county is expressed as a proportion of the total number for the State. The STAMPP system identifies thirty-three categories of improvements, including pavement, shoulder, guiderail, and drainage needs. Treatments range from routine maintenance to major reconstruction. The data collected from the STAMPP program provides systematic pavement condition data that is filtered through a treatment matrix, and is used to identify appropriate treatments for each roadway network. The data is also used to monitor the performance of the highway system, and aids in identifying candidate projects for maintenance, pavement preservation, and major rehabilitation. (NOTE: Please consult PennDOT PUBs 33, 73, 343, and 336 for additional information on field and automated surveying procedures.)

**Transportation Improvement Program:** Document required by Federal law, by which MPOs approve the use of Federal funds for surface transportation programs and projects; Usually updated every two years; Must be fiscally constrained.

**Transportation Equity Act for the 21st Century:** Federal legislation authorizing the expenditure of Federal funds for transportation improvement projects; A six-year bill signed into law in June 1998, and extended beyond the original expiration date of September 2003.

**Twelve Year Transportation Program:** Document used to list transportation programs and projects to be funded in next twelve years in Pennsylvania; Required by Act 120 of 1970; Approved by the State Transportation Commission; Includes projects from all modes (air, rail, public transit, ports, roadways, bridges, etc.); Divided into three four-year segments; First Four Year segment is identical to the TIP (e.g. TIP is the First Four Year Segment of the TYP).